PAINT and varnish PRODUCTION

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THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

NOVEMBER
1949

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Iodine Value (Wijs)	minimum 125
Free Fatty Acid (as oleic)	98 - 100%
Acid Number	195 - 199
Saponification Value	196 - 200
HEAT STABILITY: After heating to 235° C for five hours with CO_2 Color-Gardner Standards 1933	5 - 7

HARDESTOIL 16

Titre	(42.8 - 48.2° F) 6.0 - 9.0° C
Color-Gardner Standards 1933	3 - 5
Iodine Value (Wijs)	minimum 135
Free Fatty Acid (as oleic)	96 - 98%
Acid Number	191 - 195
Saponification Value	192 - 196
HEAT STABILITY: After heating to 235° C for five hours with CO_2 Color-Gardner Standards 1933	5 - 7

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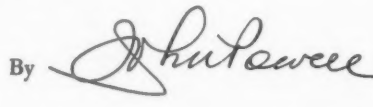
New Avenues

RECENT conventions of the National Paint, Varnish and Lacquer Association, and the Federation of the Paint and Varnish Production Clubs, gave striking evidence that the paint industry has made great progress in technical developments, and offers an excellent opportunity for continued progress in this direction.

The recent war had presented many new problems to our paint research men which opened new avenues for further investigation. As a result, many new and improved paint products are being offered to the public to-day which were never dreamed of before. The industry has taken on a scientific look with the increasing number of chemists being employed in the protective coatings field. It has been estimated that for every 1,000 chemists employed, 41 are in the paint field. In view of these developments, many of our universities and colleges are now offering courses in paint technology and have reported high enrollment. In addition, research in the paint field has continued at a high level with many firms and universities sponsoring projects relating to paint development and manufacture.

In recognition of these trends, PAINT AND VARNISH PRODUCTION has dedicated itself to keeping the production men of the coating industry well-informed on recent technological advancements taking place in the industry. It is our purpose and desire to see that all phases of paint technology are covered. That there is a need for such a publication has been confirmed by many leaders in the field and we are grateful for their interest and suggestions. We shall do our best to make PAINT AND VARNISH PRODUCTION a valuable service to the technical men of the paint industry and in this regard, criticisms and suggestions will be welcomed and appreciated.

By  Publisher

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NEXT ISSUE

Our December issue will contain an interesting article entitled "Emulsion Paints" by Henry F. Payne of the American Cyanamid Company. Since emulsion paints have become an increasingly important factor in the surface coating industry, an article on this subject was considered timely and appropriate. Mr. Payne discusses in detail such important factors as emulsifying agents, stabilizers, particle size, temperature limitations, chemical stability, general composition, pigmentation and formulation. He gives special attention to the "oil in water" types covering the use of drying oils and resins designed to improve the film properties of these paints.

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Editorial Comment

They Like Our Paints

A RECENT Commerce Department report revealed that American paint manufacturers have shown considerable interest in broadening their export market in view of their requests for information on foreign business. This was considered quite unusual by the officials of the Commerce Department because American exports of paints, varnishes and lacquers ran less than 3% of the total sales during the past ten years. It was estimated that this export business amounted to $31,006,000 and was done by a very small percent of the paint manufacturing concerns in this country.

An interesting point brought out in this report showed that our chief export outlets for paint are countries which have and are making considerable advances in paint manufacturing methods. Where American paints are introduced, experience has shown that their superior quality creates their market. The versatility, variety and quality of our ready-mixed paint resulted in a heavy demand for them in world markets. More than half of our exports last year were ready-mixed paints, stains and enamels. Cellulosic lacquers were next and these were followed by bituminous paints, varnishes, water paints and paste colors respectively.

Mixing Paints by Sound

RESEARCH men at the Sherwin-Williams Company's laboratories in Chicago are conducting experiments on the possibility of treating paint with high-frequency sound waves to prevent it from settling. This has been a problem with paint manufacturers for some time, especially those who provide ready-mixed paints.

The principle used is the same that is currently being employed by milk companies to homogenize milk. However, the problems are greater because the ingredients are much more difficult to mix. According to these scientists, if this development is successful, there will be no need for stirring paint prior to application. It will also mean a reduction in production costs.

Just think, equipment built on the sound principle may replace hugh rolling mills and large stirring vats, now in use. It would also mean a better product:—less variation in surface color and greater hiding.

The unit now used by Sherwin-William's scientists is 2,000 watt sound generator with a speed of 150,000 r. p. m. It contains 60 small cone-shaped holes in a stationary head which develops sound of 150,000 cycles per second at top speed. This is about 10 times the maximum audible frequency. Paint to be mixed is placed on top of the generator and it may be possible in commercial use to simply pass paint through a field of sound waves—Sound Paint!

Grinding Without Mills

A NEW chemical transfer process for the combination of metal pigments, free of water, with resins and oils has been announced recently by a research and development organization of Dayton, Ohio.

The new method substitutes kettle, heat control and stirring apparatus for the heavy mills which as presently being used to break down and disperse pigments into pastes. The method effects a homogenous dispersion which may be used for paints, plastics, inks, linoleums or whenever a pigment paste is required.

The first phase of the process consists of first saponifying the vehicle by the addition of an alkaline agent. The saponified oil is heated gently, and to it, pigment either as press cake or in a slurry is added. The addition of a small amount of weak acid such as acetic anhydride accomplishes the precipitation of the pigment and fatty acid oil components. Water separates and is discarded. Glycerine is then introduced and the mixture is subjected to a heat treatment to esterify the fatty acids and produce the mono-,di-, and tri-glycerides of these acids. The resulting product is an oily pigment paste dis-

persion of smooth consistency, comparable to the present grinding-mill products, according to the inventors.

In addition to pigmented oil gels, pigmented fatty acid glycerides, resins, and resin gels may be prepared by variant procedures under the foregoing method. A total of eight U. S. patents have so far been issued as a result of work under this development with other applications pending.

Equipment for this process involves only the use of stainless steel containers. Such equipment is the same as that normally used in the remainder of the processing which paints undergo, and hence can be integrated with the latter in a continuous process, eliminating the batch method now in use. Since the process in continuous, simple and sensitive control is possible.

The products come in paste form and can be delivered in pails, kegs and drums. Color may be incorporated at the same time the transfer process is taking place, and the product may be cut to suit the requirements of the user.

One paint firm is using the process commercially. It has been used successfully with zinc, lead, and titanium pigments and samples have showed good package stability for years.

This is a new approach to the problem of dispersing pigments in our present day vehicles. Breakdown methods by pebble and roller mills have been the only methods used, and to many these were considered too slow. This continuous process may be the answer, but it is difficult at this stage to evaluate the process for its practicability to the paint manufactuer. No doubt there are limitations. However, the process is new and different, and is worth some consideration by the production men of the industry.

Safflower Oil

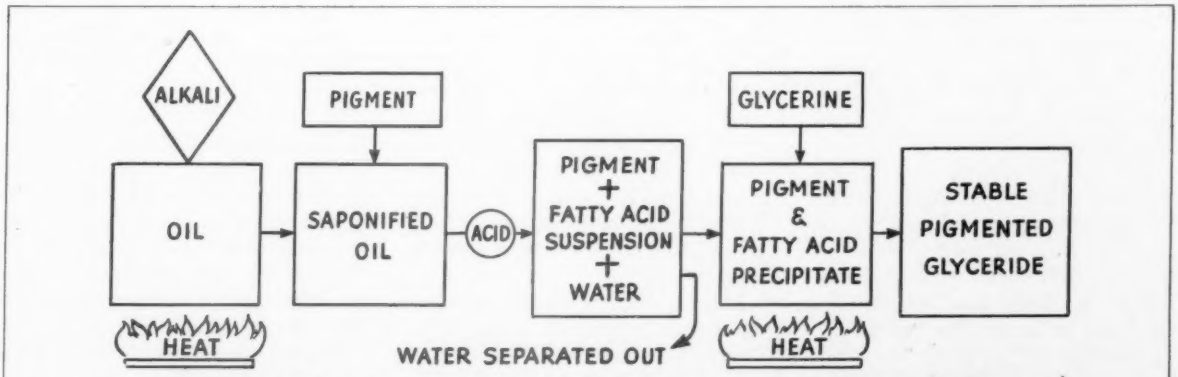
LAST month we heard that Safflower oil, previously available in the United States only in sample quantities, is now in commercial production. It has been estimated that the production rate will be about 1,000,000 pounds per month, with prospects for much larger production in the next year.

Safflower is a new American farm crop. It is native of the Himalayan foothills of India. Introduction of this crop in America was made in 1924, but it was not until 1942 that extensive plant breeding was initiated. At that time, little was known about the adaptability or cultural methods, and the University of Nebraska under the direction of Dr. Carl E. Claassen started an intensive program of agronomic research to determine best places for growing and to increase cultural capacities.

From the paint manufacturers' standpoint, the oil of Safflower has many interesting properties. It has an acid number less than 1, and an iodine number of about 150, and is very light in color. By addition of proper driers, it will dry about as fast as linseed with driers. Because it contains no linolenic or other triene acid, it does not after yellow. It contains 70 to 75 per cent linolenic acid as the glyceride, and the balance being primarily oleic.

Experiments have shown that when used in paint, safflower oil yields a film with excellent luster. It may be used in combination with alkyd and modified phenolic formulations.

Supplies of this oil for 1949–50 are adequate for production evaluation only, and the marketing program is designed on this basis. Larger production within the next year should permit good commercial use of this oil in the paint field.



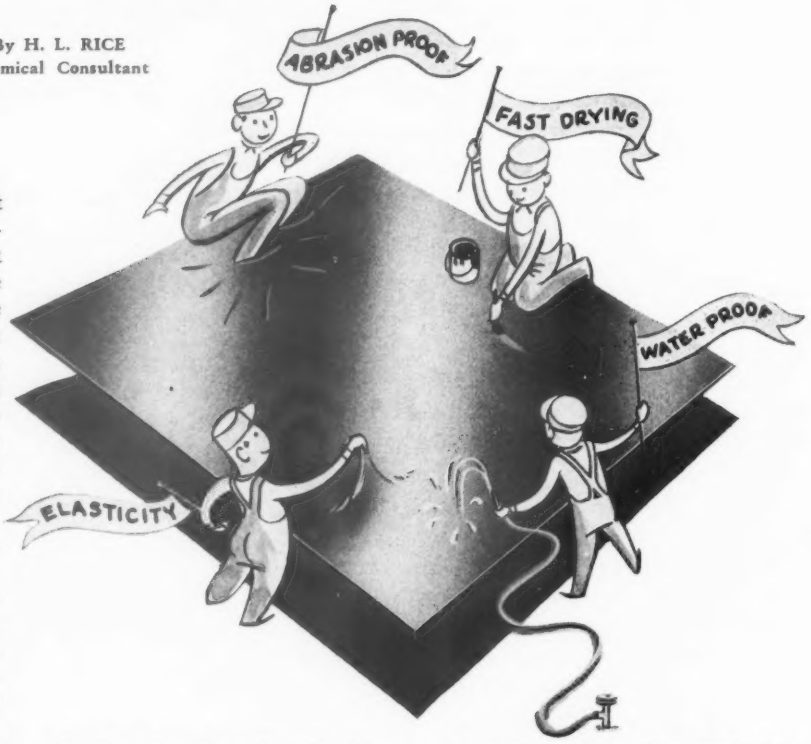
GENERALIZED SCHEMATIC REPRESENTATION OF KOL PROCESS

THE USE OF

DRYING OILS

with Polymerizable Materials

By H. L. RICE
Chemical Consultant



THE causes for failure of paint films have been given considerable attention during recent years. Much progress has been made in formulation techniques, surface preparation process, and application methods to obtain optimum film properties. However, recent research has revealed that the drying oil component plays an important part in film properties. Improper use of drying oil and improper formulation will constitute such failures as: (1) Lack of waterproofness, (2) Low coefficient of abrasion resistance, (3) Lack of proper resistance to the elements as to prevent them from cracking, alligatoring, checking and powdering, (4) Poor coefficient of expansion as to prevent shrinkage of film on metal surfaces as well as on concrete. (5) Non-elastic properties to withstand the degree of change of climatic conditions. (6) Lack of properties of moisture vapor impermeability to prevent sweating. (7) Injudicious use of driers which act as catalysts to promote the oxidation of drying, which is akin to polymerization. (8) Incorporation of reduced micronic size of pigment solids and other fillers.

Why is it not possible to obtain the desirable features of paints which comprise the drying oil type? What must be done to obtain these? It would be considered germain to the subject to delve into the physical chemistry of drying oils, but an understanding of some of the basic principles of polymerization will help considerably in formulating coatings which have better film properties.

Drying oils such as linseed, chinawood and perilla are composed of mixtures of highly unsaturated fatty acids of the 18 carbon group which contains one, two and three double bonds, and in some cases, the carbon atoms may number as high as 24. The type of fatty acids contained in these drying oils consist of approximately 18% oleic ($C_{17}H_{33}CooH$) with one double bond in the hydrocarbon chain, 37% linoleic and ($C_{17}H_{31}CooH$) with two double bonds, and 40% linolenic acid ($C_{17}H_{29}COOH$) with three double bonds.

It is at the double bonds, where the portion of unsaturation exists. The iodine number of the oil varies from 160–190, depending on the source of the oil, and the method of testing. It goes without saying that the unsaturated portions of the fatty acids, and the positions of the double bonds determined their drying properties and to a certain extent their water proofness. These drying oils will also contain some free acid, with acid values in the neighborhood of 6. It is significant to note that a thin layer of drying oil will absorb up to about 15 to 20% of their own weight of oxygen from the air during the process of drying, or of oxidation. During this stage they become transformed into a relatively elastic and insoluble film, which in the case of linseed oil is called linoxyn.

These type of films will have fair adhesion to wood and most metals. However, their main defects are that they are permeable to water, have very low abrasion resistance, do not respond well to climatic changes, and

are not sufficiently elastic to withstand the various cycles of expansion and contraction of the surfaces upon which they are coated.

Drying Process

VERY little progress to date has been made of deriving information of the process of drying of such oils. As already explained, oxygen will be absorbed in large quantities, much of it forming peroxides. It is a known fact that the drying oil, for a portion of the time during the "drying" or oxidation period, will remain fluid until the maximum amount of oxygen has been absorbed by the film. Thereafter, the amount of oxygen absorbed will be slight. The final molecular weight can be determined by the cryoscopic method, and it will be found that the molecular weight is over twice that of the drying oil before oxidation of the film had been increased. During the oxidation period the iodine value of the oil decreases, because of the absorption of oxygen at the double bonds. It is significant to understand that polymerization of the oil can be accomplished in the absence of oxygen if the oil be held at high temperatures. This is indicated by a rise in molecular weight, increase in viscosity, accompanied with a decrease in the iodine number value for the oil thus treated. The final state of the polymerized oil is a semi-solid gel, which is not reconvertable. Thus it will be noted, that these drying oils, because of their state of unsaturation can be polymerized with the aid of heat in the absence of oxygen, as well as in the air, where oxygen is abundant. It is needless to state that drying in the air is much slower, hence recourse to catalysts in the form of metal driers, to speed up the rate of drying or actual polymerization. The relative marked degree of success for a given paint in regard to the type of film depends upon, to some extent, the judicious use and amounts of the various types of driers. The various metal driers have different degrees of catalytic action in the oxidation of drying oils. Certainly different properties will result for the subsequent paint film which will either prove beneficial or detrimental. Driers in themselves cannot give to a paint film the desired properties now lacking. However, if we get an understanding of the correct use of driers, we can at least with other remedies bring about a better type of film than is obtained at present.

In order to cut down the length of time required to oxidize drying oils, it is the custom to treat them in such a manner so that they become bodied up for instance, as in the case of boiled or stand oils.

Oils produced by solvent extraction, which may be carried out in the raw or bodied state have faster and more uniform rates of drying than the ordinary oils used in the paint industry. These oils are segregated in several fractions. Some have properties of faster drying tendencies and heat bodying effects, while others have slower bodying and drying properties than the original drying oils. The former need a plasticizer such as dehydrated castor oil as their film becomes too brittle, while the latter are used in paints having slow drying periods, to obtain fairly durable films.

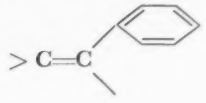
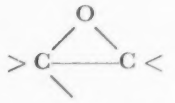
Closed Chain Additives

ONE of the reasons why we have difficulty in arriving at a clear understanding, with regard to the oxidation reaction, lies in the source of knowledge that while oxygen at times will attack all olefinic linkages, there will not result in intermolecular linkages between the olefins involved. It is common knowledge that the formation of peroxides to olefins by the addition of oxygen will usually decompose with rupture of the carbon chain at the olefinic bond. This is the reason why carbon dioxide and volatile fatty acids and aldehydes of low molecular weight are formed in the drying oils. It would be best to describe drying as a breakdown of peroxide linkages, formed initially on olefinic double bonds, and in the process of breakdown resulting in cross bridging between molecules, rather than rupture of hydro-carbon chains at the olefinic bonds.

It is significant to mention that many paint manufacturers realize the deficiencies which exist with paints formulated from drying oil vehicles. The many types of alkyds attest to the fact that no longer will the paint industry be bound by rule of thumb methods handed down to us through the ages. The reason we can never attain better waterproofness and resiliency with drying oils is the fact that they are composed of molecules of a straight chain. Resort to the use of driers acting as catalytic agents, at best, only increase the molecular weight of the film by the absorption of oxygen. What is required is the introduction of molecules of a closed chain, as alkyds, where the use of phthalic anhydride is employed very often. In the case of the alkyds, glycerol, pentaerythritol or other polyhydric esters of phthalic acid are generally modified with fatty acids or vegetable oils to give a more desirable property of flexibility and waterproofness.

Alkyds of this type are the most versatile of all types of resins. Their coatings are employed for practically every type of application. They are employed as the main polymeric material, or as plasticizer for other resins, and their properties can be formulated so that they are made into nonconvertible, heat convertible or oxidizing resins. This is not possible with just straight drying oils, which have to depend upon driers alone to be made into films by oxidation. The wide range of properties and uses of the alkyds is made possible by the large number of variations in the amounts of pentaerythritol, glycerol, and glycol with the type and quantity of the fatty acid or oil used to modify these alcohols. Then again other properties have been obtained by using other materials such a phenolics, styrene and rosin derivatives.

By the same token resort has been made to employ synthetic rubber, incorporated in a vehicle of treated drying oils, aromatic hydrocarbons, and coal tar thinners and pigments, which are opaque and weather resistant. Here we have materials consisting of conjugated and cumulative double bonds. The molecules that are derived from chains, where these types of bonds are found, most naturally would be synthetic rubber. Due to the polymerization of molecules contained in a conjugated and cumulative system, the end product offers better resiliency, because of the substitution and addition of other types of molecules as compared to those in a straight chain of drying oil which has no conjugated and cumulative double bonds.

Group	*Compound*
$>C{=}C<$	Ethylene, vinylchloride
$>C{=}C{-}C{=}C<$	Butadiene, neoprene
$>C{=}O$	Aldehydes
$>C{=}C{-}O{-}C{=}O$	Vinylacetate
$>C{=}C{-}O{-}C{=}C<$	Divinylether
	Styrene
	Ethyleneoxide
$>C{=}C{=}O$	Ketene

Influence of Conjugation

LET us examine for a moment the influence of conjugation on polymerization. The effect of metallic driers in the oxidation has been partly explained elsewhere in this article, and it would be noteworthy to compare them with materials containing conjugated double bonds. First let us start with atomic groups which particularly favor polymerization. See above table.

If perchance we start with ethylene which, as such, will be difficult to polymerize and replace 1 hydrogen atom with a chlorine, we will derive vinyl chloride which polymerizes very readily. The introduction of a phenyl group for a hydrogen atom will have the same effect. Therefore we will have to realize that certain relationships exist between molecular structure and ease of polymerization and the following points must be considered in this respect: (a.) The substitution in the immediate vicinity of the unsaturated bond. (b.) Conjugated and cumulative double bonds.

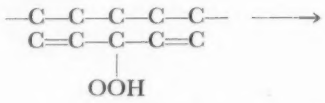
Regarding the first premise, the substitution of alkyl molecules have a moderate influence on polymerization, generally speaking. The rate of polymerization and ease thereof can be increased or diminished depending on the position of the alkyl radical introduced, in relation to the active linkage. This and meta methyl styrene polymerize more readily than the unmethylated substance, which is not true in the case for para methylstyrene. However, in the case of the halogens, the action is much more pronounced. As indicated, the very marked increase in the tendency to polymerize is very apparent in the case of ethylene. This will hold true as long as the number of halogen atoms substituted are not too many. If the number of halogen atoms is increased there is a tendency for the polymerization to ease off very rapidly.

In regard to the second premise, the introduction of a second double or triple bond into a molecule has a very distinct effect on the speed with which the unsaturated compound polymerizes. This primarily depends upon the relative positions of the two double bonds, and the most effective arrangement would be that of conjugation. The increasing distance between two interfering double bonds, influence the degree of falling off of the polymerization process.

The following are examples of the influence of conjugation on polymerization: See table below.

Eleostearic acid comprises most of the fatty acids in Tung oil. You will note that it contains conjugated double bonds, which is the reason why Tung oil is more reactive in many respects than linseed oil whose acids contain mainly isolated double bonds. However, eleostearic acid is much slower to polymerize than the acids, where the spacing of double bonds in molecules are not too far apart.

As is already known oxygen in some manner is added to the fatty acid radicals. In so doing it is believed that one of the methylene atoms is attacked between the double bonds:



It is also thought that the oxygen is introduced between the carbon and hydrogen, but still permitting the double bond to remain intact:—

However, it has been proven by experiment that peroxides do form. and if we examine the iodine values it becomes quite apparent that one double bond is displaced by each peroxide formed.

(*Turn to Page 23*)

Substance	*Formula*	*Reaction*
Diacetylene	$CH{\equiv}C{-}C{\equiv}CH$	Polymerizes extremely rapidly
Divinylacetylene	$CH_2{=}CH{-}C{\equiv}C{-}CH{=}CH_2$	Polymerizes rapidly
Vinylacetylene	$CH{\equiv}CH{-}CH{=}CH_2$	Polymerizes readily
Butadiene—1, 3	$CH_2{=}CH{-}CH{=}CH_2$	Polymerizes readily
Pentadiene—1, 4	$CH_2{=}CH{-}CH_2{-}CH{=}CH_2$	Rearranges into the conjugated system and polymerizes readily.
Hexadiene—1, 5	$CH_2{=}CH{-}CH_2{-}CH_2{-}CH{=}CH_2$	Polymerizes slowly
Eleostearic acid	$CH_3(CH_2)_3C{=}C{-}C{=}C{-}C{=}C{-}(CH_2)_7COOH$	Polymerizes slowly

Method for Testing VISCOSITY by the Ford Cup

THIS method of test shall be used for determining the Ford viscosity in seconds for paints, varnishes, lacquers and their related liquid materials. The time of efflux shall be reported in terms of the orifice used (e.g., x seconds for a Ford #3 orifice). The orifice shall be selected so that the efflux time of the material will be within the range 20–100 seconds. There is no maximum limit of viscosity to be measured by the Ford Viscosity Cup but in general when the time of efflux is greater than 100 seconds the temperature control problem is such that reproducible results are difficult to obtain.

Outline of Method

THE Ford Viscosity Cup is used by filling it level full with the liquid to be tested, thence timing the efflux of the material to the break in the liquid stream. Results are reported in terms of seconds for efflux to the break point. The apparatus shall consist of the Ford Viscosity Cup, thermometer, and timer conforming to the requirements specified in the following paragraphs (a) to (c).

(a) Ford Viscosity Cup—The Ford Viscosity Cup shall be of a corrosion and solvent resistant material and shall conform to the dimensional requirements shown in Figure 1. Orifice dimensions shall be considered as a guide for manufacture only and acceptance or standardization of the instrument shall be based upon performance. Figure 2 shows the standard flow characteristics for the #3 and #4 orifices with the Ford Cup. This plot describes the most useful range for each of these orifices and shows the relationship between time in seconds and Kinematic Viscosity in Stokes. For the range specified these are substantially straight line functions. National Bureau of Standards liquids, L, M, and N are recommended for "proving" the accuracy of cups for conformance with this specification.

(b) Thermometer—An A.S.T.M. Viscosity Thermometer having a range 66–80° F. and conforming to the requirements for thermometer 17F–39 as prescribed in A.S.T.M. Standard Specification E 1.

(c) Timer—The stop watch or other timing device used shall be graduated in divisions of 0.2 seconds or less, and shall be accurate to within 0.1% when tested over a 60 minute period. Electrical timing devices are permissible provided they are accurate and capable of being read to 0.2 seconds. Timing devices actuated by synchronous motors shall be used only on electric circuits of controlled frequency.

(*Turn to Page 17*)

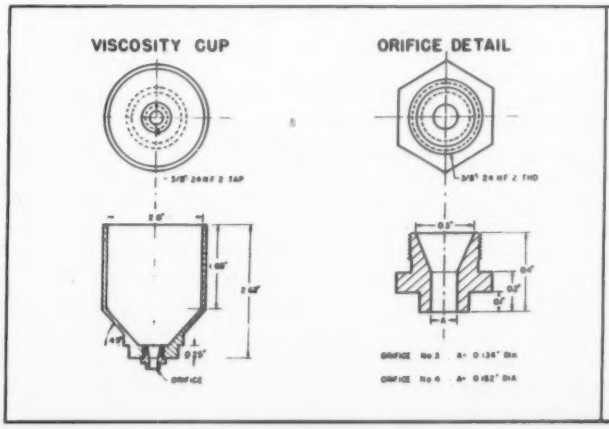


Figure 1.

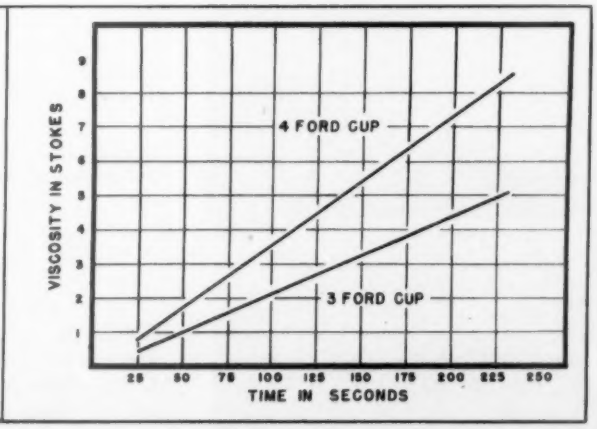
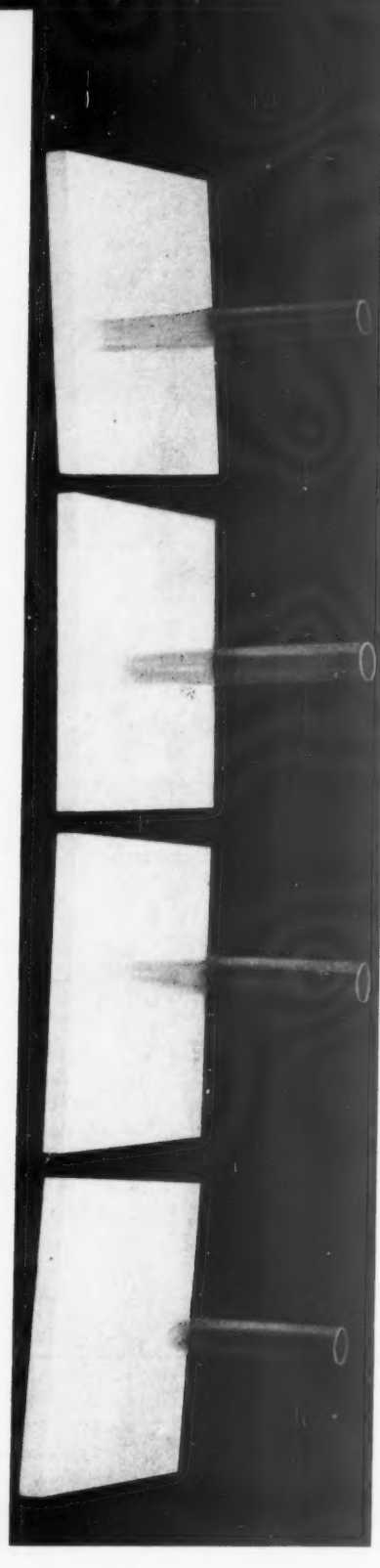


Figure 2.

PERMANENT GLOSS STA



Gloss standards here illustrate specular gloss, the surface brightness decreasing from top to bottom. The distinctness of the images reflected from these gloss standards (nominal gloss: 90, 80, 40, and 1, top to bottom).

MEASUREMENT of gloss is becoming increasingly important in many industries. For example, high-gloss paper is required for good reproduction of halftone prints, and low-gloss paper for easy reading of materials in type. Building interiors must range from semi-gloss to matte to prevent eyestrain caused by reflected images of the light sources. Gloss of a paint finish should always be adjusted to the use of the finish. Outdoor finishes, such as automotive enamels, have high gloss for permanence while matte finishes are given most war goods for low visibility. Gloss measurements are also important in defining the wear resistance of plastics and ceramics.

The gloss measurement is essentially a simple one. When a specimen is illuminated at some angle from the perpendicular, the proportion of the light reflected at angles near that of mirror reflection is defined as gloss. A critical part of the definition of gloss, however, is the amount that the reflected beam may depart from the strict direction of mirror reflection and still be counted as contributing to gloss. With glossmeters commercially available at the present time, replacement of the lamp, for example, may introduce instrumental error unless readjustment is made. The new gloss standards permit a rapid check of instrument calibration at any time and give a basis for readjustment of the instrument if required.

Gloss Standards

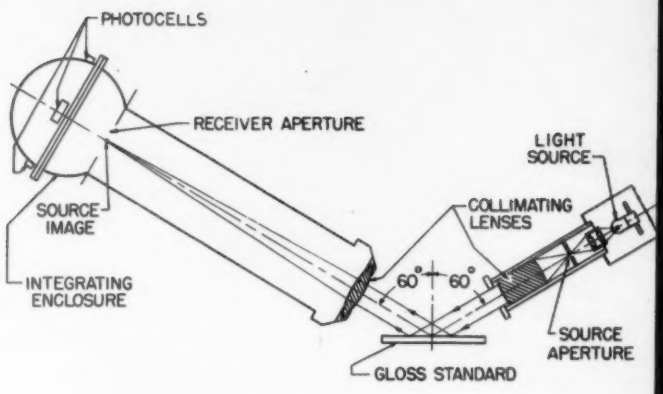
THE gloss standards have been prepared according to ASTM Method D523 for the 60° Specular Gloss of Paint Finishes. A set consists of two white Vitrolite plaques having nominal gloss values 1 and 90, and eight glazed ceramic plaques with nominal gloss values 10, 20, 30, 40, 50, 60, 70, and 80. Each plaque, approximately 4¼ inches square, is engraved with the nominal gloss value followed by a serial number. The edges and backs of the ceramic plaques are coated with glyptal cement to prevent absorption of water.

The plaques are measured for 60-degree specular gloss according to the ASTM method, using a glossmeter calibrated with the gloss reference standards of the National Bureau of Standards. These measurements include both the true gloss and a diffuse reflectance component. Corrected gloss values are obtained by subtracting the 0°–60° luminous directional reflectance measured with an ASTM receiver aperture. The corrections for each standard are included in the certificate accompanying each set. The gloss values for standards above 15 are given to the nearest gloss unit, below 15 to the nearest tenth of a unit.

Although the plaques have been selected for their superior quality a certain amount of nonuniformity is unavoidable. In order to minimize errors arising from nonuniformity, the central area of each plaque is measured, and the reverse face is marked with an arrow and centerlines. The centerlines are used for positioning the central area, and the arrow indicates the direction of illumination during measurement. The same orientation should be followed in the use of the plaques.

The uncertainty in the reported values is estimated to be $\pm$ 0.2 gloss unit for the lowest gloss standard and to increase to $\pm$ 1 gloss unit for the highest gloss standard. Since glossiness is a surface reflection characteristic, the condition of the surface

SSTANDARDS



must remain unchanged if the reported gloss values are to remain valid. The surfaces of the standards have been found to be reasonably permanent, but they must be protected from dirt and abrasion.

Even with the aid of standards it is not possible to do precise gloss measurement in the medium to high gloss range unless the glossmeter used meets very closely the aperture requirements of ASTM Method D523, or unless the reflected light flux distribution of the specimen and standard are nearly identical. Since it is not practical to meet the latter requirement, it is desirable to make a test for the former. This may be accomplished by adjusting the instrument to read correctly the gloss of a highly polished surface, such as the "90" standard, and then reading the gloss of a high-gloss surface having poorer image-forming characteristics, such as the "80" or "70" standard. If under these conditions the instrument reading for the second standard does not agree closely with the reported value, the instrument should not be used for high-gloss measurement without readjustment, preferably by the manufacturer.

Recommendations

FOR proper use of the gloss standards the following recommendations should be followed:

Clean standards before use. Standards should be washed with soap and warm water, rinsed, and dried over night. Standards having gloss value lower than 25 should be scrubbed lightly.

Handle carefully to avoid abrading the surfaces. One or two deep scratches are not as serious as a large number of small, almost imperceptible ones.

Back translucent plaques with opaque materials to prevent room light from affecting gloss readings.

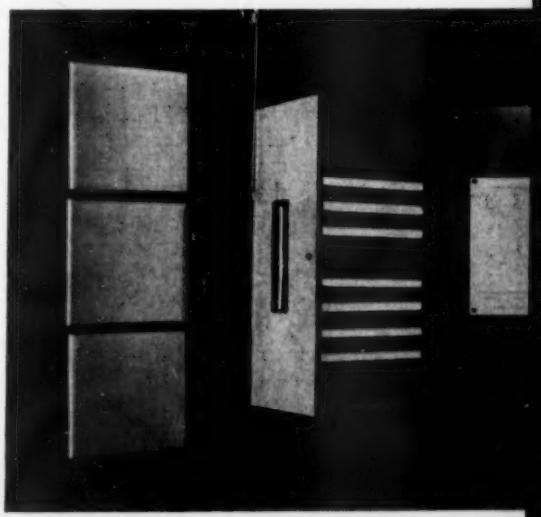
For greatest precision, use standards oriented as they had been during the original measurements.

Permanent gloss standards, covering the entire gloss range of nonmetallic commercial materials, are now available from the National Bureau of Standards. These standards, which may be used to calibrate any 60-degree specular glossmeter in the range from matte to high gloss, are made of ceramic materials for permanence, and the surfaces have been specially chosen for similarity to commercial materials whose gloss is important. Sets of the 60-degree specular gloss standards may be ordered from the National Bureau of Standards, Washington 25, D. C.

In the paint industry, gloss, which is considered one of the most important appearance characteristics of paint films, is measured by the 60 degree Hunter Glossmeter and Reflectometer. The amount of light striking the surface of this instrument at 60 degrees from the vertical is reflected at 60 degrees in the opposite direction. In the interest of getting enough light to measure gloss accurately not only the light reflected at 60 degrees, but also that for several degrees on each side is collected and measured. This works well for flat surfaces, but fails with higher-gloss types. It has been suggested that the aperature size of the instrument be reduced for higher gloss finishes.

There has been evidence that 45 degree reflections give results correlating better with visual judgements for high-gloss finishes than 60 degrees. No generally acceptable procedure has been worked out, but the use of these standards will help materially in alleviating this problem.

High, medium, and low gloss ranges are illustrated by these three tiles used in checking.



CHEMICAL and PHYSICAL FACTORS IN THE DEODORIZING OF PAINT

By R. E. HORSEY
Sindar Corporation

CONSUMER surveys made a number of years ago showed that so-called paint odors were objectionable to a high percentage of the individuals questioned. The number finding paint odors objectionable was higher than for any other consumer item.

It was outside of the scope of the survey to determine which specific ingredients were the offenders and undoubtedly this would have been an impossible job. However, it is reasonable to believe there were a number of ingredients responsible as the consumer comes into contact with all types of paint.

Unfortunately, it has been a difficult task to educate the paint manufacturer that the odor of their paint is as important as other properties. Part of this resistance was naturally an economic one, but the more difficult factor to overcome was to convince members of the paint industry that though they were accustomed to the odor of paint, and did not think it particularly objectionable, this was not true as far as the average consumer was concerned. This resistance was not unique to the paint industry as the same problem occurred in others. Many times paint manufacturers would state their sales were made only to commercial painters and they had no complaints. Obviously, the commercial painters consider paint odor a part of the job, but they are scarcely in a position to speak for the ultimate consumer. Anyone who may have had to sleep in a freshly painted room is conscious of the odor.

Reodorant and Neutralizer

FOR the purpose of this article the term "paint odor" will include paints, varnishes, lacquers, thinners, paint and varnish removers. Also the terms "deodorant", "reodorant" and "neutralizing" will be used interchangeably. There are no fixed definitions of these terms but in our industry we think of deodorants as being materials which react to destroy odors, reodorants as masking agents which cover other odors, and neutralizers as reodorants which are added in a concentration to mask another odor but not sufficient to impart another definite odor.

There is no question that the ideal paint product would have no odor but this is an impossibility unless ingredients could be used which had no odors. While there has been noticeable improvement in the odor of some paint ingredients to date they could hardly be classified as odorless.

To expect a small concentration of some chemical or mixture of chemicals to be a deodorant, that is to react with the odor producing constituents to produce no odor, is also an impossibility. Therefore, in the deodorizing of paints we are limited to either reodorization or neutralization.

Essentially, paints are mixtures of pigments, gums, solvents, oils, driers, resins, plasticizers, binders and etc. As there is such a wide selection of materials, it is almost an impossibility to produce a single reodorant or neutralizer suitable for all the possible mixtures and it is mandatory that a reodorant be custom made for each individual type of paint. In general, a reodorant must meet the following requirements:

1. It must mask the disagreeable odor of the product.
2. It must be stable over long periods of shelf storage.
3. It must not effect the drying or other characteristics of the paint.
4. It must be effective during the time required for the paint to set.
5. It must not have a residual effect which persists for weeks or months after the paint has dried.

These requirements might appear to be rather elementary, but it has required a vast amount of experimental work to find ingredients which will accomplish them. The most important physical and chemical factors are volatility and oxidation.

Evaporation and Oxidation

MOST solvents used in paints have high evaporation rates and as they are present in relatively high concentrations it is difficult to find chemicals which will mask their odors when used in a fraction of a per cent. Solvents have a tendency to carry the masking agents with them and if a reodorant is based on such chemicals alone, nothing would remain to mask the oils, driers, plasticizers and etc.

Those paint products which depend upon oxidizable or polymerizable oils for developing their protective film offer the serious problem of oxiding the reodorant ingredients. The presence of driers to speed up the absorption of oxygen makes the problem more difficult. Almost all ingredients used in reodorants are subject to oxidization and, therefore, it is necessary to select those whose oxidization rate is slower or at least not more rapid than the paint ingredients. Again the fact that the reodorant is used in such small concentrations means it is more likely to be oxidized before the film is dry.

(*Turn to page 17*)

27th ANNUAL CONVENTION

THE 27th annual meeting of the Federation of Paint and Varnish Production Clubs, held in Atlantic City on November 3, 4 and 5 together with its annual Paint Industries' Show, attracted some 1,500 members. The convention was opened by President Robert W. Matlack, who gave an overall account of the Federation's activities during 1949 and thanked the various committee chairmen for their accomplishments throughout his term of office. Elaborating on one of the several highlights of the past year, Mr. Matlack told of the formation of the Western European Federation of Paint and Varnish Production Clubs. This is a further development of the alliance which the Federation has had for the past few years with the Oil and Colour Chemists Association and the French Association of Paint and Varnish Technicians. The organizers of the new group were the French, Italian, Swiss, Belgian and Dutch associations. They comprise a total of 475 members. Negotiations are being carried on by similar technical associations in Spain, Norway and Austria. Inquiries have also been received from Denmark and Sweden as well as Western Germany. The Western European Federation will replace the French as the third member of the Federation's Alliance.

General Joseph F. Battley, president of the National Paint, Varnish and Lacquer Association, addressing the Federation, praised the scientists of the nation and said:

"The exchange of ideas between scientists will speed up development and serve as an example to all countries as a means of establishing better international relations."

"There must be many advancements in methods of production and new and better products in the coming decade," he continued. "This must be, for as the world progresses we must keep pace. Rather, we should set the pace, for the things you achieve will open new avenues of uses, help employment and the welfare of all."

He also told the Federation that a great part of the national advertising planned for 1950 by the paint industry will pay tribute to the scientists and their achievements in producing better products.

Brigadier General Hugh B. Hester replaced Major General William H. Middleswart as guest speaker on the program. He pointed out the role which the paint industry played during the last war in developing durable coatings to withstand various climatic conditions and related what research the Quartermaster Corp is doing in this respect.

Mattiello Lecture

The second day's meeting was highlighted by the Mattiello lecture given by Dr. Roy H. Kienle of the Calco Chemical Division of the American Cynamid Company. His subject was Physical and Chemical Research in the Protective Coating Industry. He examined a number of physical and chemical investigations on solvents and vehicles, but gave special emphasis to the subject of pigments. He mentioned the part the electron microscope is playing in the study of color, particle size, crystal structure and surface chemical reactions of pigments.

Foreign Activities

Dr. C. H. Rose reported on foreign activities and told of the formation of the Tri-Alliance in Western Europe. He then introduced the foreign guests: Mlle. Marguerite Caillaux of France; Paul Nievski of Havana; Hubert Idle of the Oil and Color Chemist Club in London; William Griffiths from Australia; and Brij Chandra Sah, and P. C. Reddy, both of India, presently studying paint chemistry and manufacturing in this country.

The British Association was also represented by Dr. Harry Keenan who suggested that the Alliance undertake the publication of an international journal on surface chemistry and technology covering the best original work of each country. He further stated that this journal should be published but once or twice a year.

Research Program

Dr. W. O. Lundberg reported on the Federation Research Program. The study of chemical changes that take place in commercial vehicles was undertaken two years ago, he said, and now twenty vehicles have been prepared which are being studied by five groups.

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THE 61st Annual Convention of the National Paint, Varnish and Lacquer Association was opened by president Joseph F. Battley on October 31st in Atlantic City. The theme of this year's meeting was "Progress Through Cooperation", and in this regard General Battley paid a special tribute to the technical and scientific men of the paint industry. He commended the paint industry on its scientific developments which have earned a wide recognition of valued service to other industries and to the American people. The enlargement of such services will wield a still greater influence on improving the standards of living in this country.

He predicted that the volume done by the industry will again top the billion dollar mark, the third successive year that the industry has achieved this figure. In tonnage, the volume may even exceed that of last year. The ten year average of the industry from 1937 to 1947 was 450 million dollars. The present volume is more than double that figure and he predicted that it would go even higher.

General Battley's Report

Reporting on some of the more important activities of the association during the past year, General Battley stressed the services and progress made by the Scientific Section. He stated that needed additions have been made to the facilities and personnel of this section during the year. A new and major project is the investigation of dispersion and the types of machinery best suited for this purpose. A dispersion laboratory has been set up at headquarters and, with the cooperation of equipment manufacturers, various types of mills and their effectiveness are being studied. This investigation, when completed, will serve as a guide to better products and more satisfactory operations.

Among other studies made this year are those involving fire retardant paint, paint as a vapor barrier, fume control, and the ill effects of moisture on paint jobs. Also, work has been done to develop better testing methods, to determine the quality of contemporary paints through exposure tests, and to evaluate catalytically cured varnishes.

The industry is kept advised of technical developments through the association's Scientific Section circular and indexes. The library is expanding its facilities and many technical men are using it as an unusual source of information. Special circulars are prepared from time to time, such as the one concerning the Maryland Toxic Finishes Law which brought together the data gathered from tests and other sources concerning this law, and pointed out its impractical nature.

The association has done a great deal to encourage courses in paint technology in colleges and universities throughout the country. Many new ones have been instituted and work has been done to coordinate existing technical knowledge by contacting various university laboratories and research organizations.

The Industrial Finishes session was held in the afternoon with Joseph A. Hager presiding. Of particular interest to those engaged in production and technical phases of paint production were talks on safety in lacquer manufacturing and the use of silicone resins as new materials in protective coatings.

Safety

Charles L. Jones, Safety Engineer for the Hercules Powder Co., spoke on safety in lacquer manufacture stressing the following points: (1) Provide a sound plant design. (2) Guard against fire, explosion and toxicity hazards. (3) Store and handle nitrocellulose safely. (4) Store and handle film scrap safely. (5) Locate solvent storage well away from other buildings. (6) Guard against static electricity and ground all equipment. (7) Provide good ventilation. (8) Provide adequate fire protection and train employees to use it. (9) Isolate the storage of finishes products. (10) Train workers to recognize hazards.

Silicones

Dr. W. R. Collings of the Dow Corning Corporation spoke on the use of silicone resins and fluids in the manufacture of protective coatings. First, he discussed silicone polymers pointing out their basic chemical structure and how such properties as heat resistance, moisture resistance, etc. were dependent on them. An interesting point made by Dr. Collings in this connection dealt with the fact that any silicone resin is not necessarily heat-resistant by virtue of having a silicon-oxygen structure. Heat resistance of the order demanded on hot stacks and the like comes only if the organic part of the silicone resin is itself inherently heat resistant. If the organic part is not heat resistant, the silicone will not be heat resistant.

The greatest use of these resins has been for heat resistant paints for use on hot equipment in the oil industry. The coatings are said to stand up pretty well up to 750° F. by pigmenting with aluminum, which has a great deal to do with this degree of heat resistance.

Other types of silicone materials have showed some interesting properties in the coating industry. These are the fluids which are used to prevent silking and flooding in many types of coatings. Silicones as antifoam agents were also discussed.

The second day's meeting was featured by a talk by W. Stuart Symington, Secretary of the Air Force, who emphasized the national defense program as the only means of being militarily pre-

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. . . DEODORIZING

(*From Page 14*)

Studies made in the past have shown that the majority of the objectionable paint odor is dissipated by the time the paint drys to a hard non-tacky film. In oil paints, and also some varnishes, the dry film has a tendency to lock in residual odors so they no longer evaporate at sufficient rate to cause an objectionable effect. Yet this same film will not lock up certain reodorant ingredients. If no residual effect is desired, these must be eliminated in the reodorant formulation.

It is byond the scope of a reodorant to cover odors which may occur from instability of the paints. Paints have been observed which have a definite rancid odor due to oxidation of oils. In water paints insufficiently preserved, development of sour odors due to attack by microorganisms is possible. These problems should be solved by using suitable anti-oxidants and preservatives, and not through the use of reodorants.

Most of the ingredients used in reodorants are oily in character. As their oxidation rates are slow they can interfere with drying characteristics if used excessively.

Evaluation of Reodorant

IN evaluating the suitability of a reodorant for a particular paint product it is necessary to make the test simulate as nearly as possible the conditions under which the paint will be used. Adding the reodorant to a small sample of the paint and smelling it out of a can or bottle is not a fair or practical test. Equally unsound is to paint the inside of a small box and evaluate the odor. Such a procedure may be satisfactory for a basic screening program but eventually an actual use test should be made. Often a reodorant may seem perfect when tested in the laboratory but if an entire room is painted the reodorant may be in excess or deficient in masking properties. Another difficulty with laboratory evaluations is the possibility of other odors being present which will conflict with the reodorant and give a false reaction.

In conclusion, emphasis must be placed on the necessity of selecting the proper odor for each type of paint product and not to expect one reodorant to be a cure-all. Further, if major changes be made in a paint product be sure it does not change the reodorants effectiveness.

. . . TESTING VISCOSITY

(*From Page 11*)

Temperature of Testing

STANDARDIZATION of and measurements with Ford Viscosity Cup shall be carried out at 77° F. or 25° C. The procedure is as follows:

Viscosity determinations shall be made in a room free from drafts and rapid changes in temperature. For standardization and referee tests the room shall be between 68° and 86° F. For routine testing the effect of room temperature must be carefully observed. (It is impossible to predict the effect of temperature change on each product with which this instrument may be used but this factor may be less than 1% per degree Fahrenheit for some liquids while others have shown as high as 25% variation per degree Fahrenheit.) Determinations shall not be made at temperatures below the dew point of the atmosphere surrounding the instrument. The instrument shall be leveled so that the cup may be filled perfectly level full without meniscus or overflow at one side. Method of Measurement—The time of efflux may be measured by method (1) or (2) below. If accurately performed, duplicate results are obtained.

(1) The orifice is held shut with the finger and the cup is filled with the material which has already been temperature adjusted to 77° F. or 25° C. and has been carefully strained to remove any foreign material. The top of the liquid shall be perfectly flat with no meniscus evident. The cup now contains 100 cc of material. If overfilled the surface shall be scraped with a straight edge until the excess liquid has been removed to the overflow trough. The moment of efflux starts when the orifice is opened by removing the finger and ends at the first break in the stream.

(2) The orifice is held shut with the finger and the cup is slightly overfilled with the material which has already been temperature adjusted to 77° F. or 25° C. and has been carefully strained to remove any foreign material. The top of the cup is then closed by sliding a glass plate over it from the side, whereby no air bubbles shall remain between the plate and the top surface of the material being tested. The cup now contains 100 cc of material. The orifice can now be opened without having the contents of the cup run out. To measure the time of efflux the glass plate is rapidly pulled away to the side whereby the material adhering to the plate is scraped off on the inside edge of the cup. The time starts with the removal of the plate and stops with the first break in the stream.

Accurate control of temperature is of utmost importance. In standardization tests it has been found necessary to adjust the temperature of the sample before putting it in the cup and then to check the efflux temperature from the cup by holding a thermometer in the liquid stream. *Temperature must not drift throughout the efflux period.*

Following each determination the cup shall be carefully cleaned by the use of a suitable solvent and a soft brush. Under no condition should metal cleaning tools be brought into contact with the instrument. The orifice is the most critical portion of the device and it should be inspected after each usage to avoid any film deposit or nicks on the inside walls.

Reporting Results

THE efflux time in seconds for the orifice used (e.g., 23 seconds—#4 Ford) shall be reported. Most paints, varnishes and lacquers do not represent Newtonian liquids, therefore a translation to absolute units by means of the chart shown in Figure 2 is not accurate but is instead a specific result in terms of the device used.

With proper attention to details of method of procedure and temperature control results in different laboratories with different operators under referee or standardization conditions of testing, should not differ by more than $\pm 1.0\%$.

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402 Bowen Building, Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Process for Making Bodied Oils

U. S. Patent 2,480,485. Willy Lange, Cincinnati, and Robert G. Folzenlogen, Golf Manor, Ohio, assigners to The Procter & Gamble Company, Cincinnati, Ohio.

The process of producing a boron trifluoride bodied oil, characterized by rapid drying rate, improved color and freedom from crystallization at normal room temperature, which comprises heating an unsaturated fatty oil in the absence of a polymerization catalyst at a temperature from about 250° C. to about 350° C. for a brief period to effect rearrangement of fatty acid radicals in said oil and to inactivate substances in the oil reactive with boron trifluoride to form salts which in secondary reactions yield water-stable compounds with pigmentary value, without effecting substantial heat bodying and substantial reduction in the iodine value of the oil, and thereafter bodying the heat treated oil at lower temperature in the presence of a small amount of boron trifluoride until the desired degree of bodying is attained.

Coating Composition

U. S. Patent 2,480,824. Clyde G. Murphy, Parlin and John P. Sermattei, Matawan, New Jersey, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.

The process of packaging which comprises applying a strippable plastic webbing composition to the article to be packaged and applying a strippable topcoat composition thereover, said webbing composition comprising a mixture of 1.4–10 parts of polyvinyl butyral resin to 1 part of polyvinyl acetate resin, 5–25% of a compatible plasticizer based on the weight of the resin mixture, 10–40% of a rust inhibiting oil based on the weight of the resin mixture, and a solvent composition containing at least two solvents, 70–30% of the solvent composition having an evaporation rate equal to that of acetone, and 30–70% having an evaporation rate equal to that of ethyl alcohol.

Stabilizing Polyvinyl Chloride

U. S. Patent 2,481,086. Desmond Cleverdon, Bournemouth, and Hanns Peter Staudinger, Ewell, England, assignors to the Distillers Company Limited, Edinburgh, Scotland.

A heat stable vinyl resin composition comprising a polymeric vinyl resin containing vinyl chloride units in its structure and a stabilizer comprising a dibutyl dialkoxy compound of a metal of group IV b of the Periodic Table according to Mendeleef, the alkoxy groups in said metal compound each containing not more than eight carbon atoms and compositions remaining substantially translucent to transparent on prolonged heating.

Fluorescent Zinc Oxide

U. S. Patent 2,481,344. Lawrence J. Reimert and Erastus A. Fatzinger, Palmerton, Pa., assignors to the New Jersey Zinc Company, New York, N. Y., a corporation of New Jersey.

A fluorescent pigment comprising the product of calcining in a reducing atmosphere at a temperature within the range of about 850° to 1000° C. a mixture consisting of (1) a base material composed of zinc oxide and magnesium oxide, the magnesium oxide comprising from about 3% to about 50% by weight of the zinc oxide-magnesium oxide mixture, and (2) from about 0.25% to about 5% lithium sulfate by weight of the base material.

Tall Oil Treatment

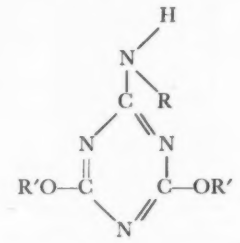
U. S. Patent 2,481,356. Ernest Segessemann, Wood-Ridge, New Jersey, and Nicholas M. Molnar, New York, N. Y.

A treatment of tall oil which comprises the steps of heating the alkali soap of tall oil with an amount of alkali at least 100% in excess of the combined alkali in the soap to a temperature of from 230° C. to 300° C., for at least four hours in order to effect isomerization and subsequent degradation of the unsaturated fatty acids into saturated fatty acids of a lower carbon content and to convert the rosin present in the original tall oil into a more saturated form, liberating the fatty acids and the stabilized rosin by acidification with a strong acid and separating the fatty acid fraction from the stabilized rosin by fractional distillation.

Resinous Compositions

U. S. Patent 2,481,155. Frederic C. Schaefer, Stamford, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A composition comprising a resinous material obtained by effecting reaction between ingredients including (1) an aldehyde and (2) a thermoplastic composition resulting from a transesterification reaction between ingredients including (a) at least one triazine derivative represented by the general formula



where R represents a member of the class consisting of hydrogen and monovalent hydrocarbon radicals and R′ represents a monovalent hydrocarbon radical and (b) a dihydric alcohol in which the hydroxy groups are members of the class consisting of primary and secondary hydroxy groups, and further characterized by being a member of the class consisting of hydrocarbon dihydric alcohols and dihydric alcohols having an oxygen atom of a linear ether in a hydrocarbon chain and which are free from epoxy groups.

Depolymerizing Vinyl Ether

U. S. Patent 2,483,374, Calvin E. Schildknecht, Easton, Penna., assignor to General Aniline and Film Corporation, New York, N. Y., a corporation of Delaware.

A process of partially depolymerizing a flexible, form-stable high molecular weight and viscosity polyvinyl isopropyl ether of intrinsic viscosity 16 containing 0.1% of p-hydroxyphenyl morpholine, which comprises milling the polymer with 2% of benzoyl peroxide at a temperature between 50° C. and 100° C. and interrupting the process when the intrinsic viscosity of the polymer is 4 by milling into the polymer at a temperature between 50° C. and 100° C. 1% of p-hydroxyphenyl morpholine.

Improving Tar Adhesion

U. S. Patent 2,482,331. Robert Dupas, Clichy, France, assignor to Standard Oil Development Company, New York, N. Y., a corporate body.

A bituminous composition of improved adhesive power which consists essentially of a bitumen having incorporated therein from 0.1 to 10% of a complex compound of a polyvalent metal chloride and an organic dyestuff containing a basic group selected from the group consisting of menthylene blue hydrochloride, rhodamine hydrochloride and malachite green hydrochloride.

Hydroxy-Coumarin Esters

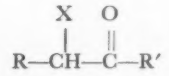
U. S. Patent 2,482,511. Jan Rosicky, Prague, Czechoslovakia, assignor to Spojene farmaceuticke zavody, narodni podnik, Prague, Czechoslovakia.

The process of manufacturing the ethyl ester of 3,3′-carboxymethylenebis-(4-hydroxycoumarin) which includes the step of condensing benzotetronic acid with glyoxylic acid ethyl ester ethyl alcoholate.

Halogenated Phenacylpyridnes

U. S. Patent 2,482,512. James M. Smith, Jr., North Plainfield, New Jersey, assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

Compounds having the general formula



in which X is a halogen, R is a member of the group consisting of pyridine, benzopyridine and alkypyridine radicals, and R′ is a halogenated aryl radical.

Drying Oil Products

U. S. Patent 2,482,736. John B. Rust, Montclair, New Jersey, assignor to Montclair Research Corporation, a corporation of New Jersey.

The process of heating a drying oil and a beta-unsaturated monohydric alcohol ester of a 1,2,3,6,-tetrahydrophthalic acid, at between 200° C. and 300° C. whereby the drying oil is improved as regards color-stability, gel time and drying time.

Green Camouflage Paint

U. S. Patent 2,481,366. Kenneth V. Thimann, Cambridge, Mass, assignor to the United States of America as represented by the Secretary of the Navy.

Method of preparing a paint which comprises grinding chlorophyllic vegetable matter in the presence of water, precipitating chlorophyll in combination with protein by means of a metal sulfate selected from the group consisting of zinc, magnesium, copper and manganese, stabilizing the chlorophyll by addition of sugar and magnesium sulfate, partially drying the mixture in the presence of a drying oil, and emulsifying the mixture in a varnish comprising a treated natural drying oil and a light colored oil modified rosin.

Method as claimed in claim 9 wherein said metal sulfate is zinc sulfate, said sugar is sucrose, and said rosin varnish is based upon a linseed oil modified rosin, and said mixture is dried in the presence of glue, along with the oil.

Stabilized Bituminous Emulsion

U. S. Patent 2,481,322. Paul E. McCoy, San Francisco, Calif., assignor, by mesne assignments, to Stancal Asphalt and Bitumuls Company, San Francisco, Calif., a corporation of Delaware.

A freely flowing, full mixing, non-fermentable, non-grainy oil-in-water type emulsion capable of mixture with fine aggregates without breakdown, comprising 50–70% by weight of water-insoluble, water-dispersible high molecular weight, thermoplastic organic material dispersed in 20–50% by weight of water and containing 0.25–10% by weight of a high molecular weight waste soda liquor derivative described as follows: substantially insoluble in water, benzene, carbon tetrachloride, ether, and 5.5–9.0 pH waste soda liquor: soluble in aqueous caustic solutions, diethylene oxide, phenols, acetone, ethyl alcohol: said waste soda liquor derivative being substantially free of ash, alkali metal salts, hemicelluloses and other low molecular weight organic compounds.

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Porcelain Enamel

U. S. Patent 2,481,474. Gilbert Goodman, Bayonne, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York.

A lead borosilicate enamel slip comprising a lead borosilicate frit, colloidal clay, and in addition to said frit and clay between about one per cent and about 5 per cent by weight of a compound selected from the group consisting of strontium chloride and barium chloride.

Drying Oils From Olefins

U. S. Patent 2,481,498. Paul H. Carnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware.

The method of producing drying oil which comprises subjecting a mixture of anhydrous hydrogen fluoride and an olefin to polymerization at temperatures within the range of 0 to 150° C., subjecting the resulting to fractionation at temperatures effective to decompose lower organic fluorides into hydrogen fluoride and olefin and thereby separating by vaporization the hydrogen fluoride and the olefin from polymer, subjecting said polymer to further polymerization for a time of at least 15 minutes but less than one hour and at temperatures within the range of 100 to 200° C. and higher than those employed in the first-named polymerization to form a drying oil, and recycling the separated hydrogen fluoride and olefin to the first-named polymerization.

Bituminous Emulsions

U. S. Patent 2,481,323. Paul E. McCoy, San Francisco, and George S. Smith, Berkeley, Calif., assignors by mesne assignments, to Stancal Asphalt and Bitumuls Company, San Francisco, Calif., a corporation of Delaware.

In the process of incorporating an alkali metal dichromate in a bituminous, oil-in-water type emulsion, the emulsified state of which is normally subject to breakdown by the addition thereto of such alkali metal dichromate, the improvement which comprises forming an aqueous solution of said alkali metal dichromate, dissolving in such aqueous alkali metal dichromate solution, in a small amount sufficient to raise the pH of said aqueous solution to within the range of about 7 to 9.5, a water-soluble, volatile, fugitive nitrogen base having an atmospheric pressure boiling point not higher than 200° C. and then incorporating said aqueous solution. with its pH so raised, in the said bituminous emulsion, in a small amount sufficient substantially to promote adhesion of the dispersed material to hydrophilic aggregate.

Oil-Modified Alkyd Resin

U. S. Patent 2,479,951. Paul E. Marling, Dayton, Ohio, assignor to Monsanto Chemical Company, St. Louis, Mo.

The process which comprises the alcoholysis of fatty oils selected from the class consisting of drying and semi-drying oils in the presence of $Ca(OH)_2$ and a polyhydric alcohol selected from the class consisting of glycerine, pentaerythritol, polyethylene glycol and mannitol, the amount of $Ca(OH)_2$ employed being equivalent to between 0.12% and 0.22%, by weight based on said polyhydric alcohol, of calcium metal contained in said $Ca(OH)_2$ the esterification of the resulting product with a polycarboxylic acid anhydride of the class consisting of phthalic, maleic, succinic, tartaric and fumaric acid followed by the addition of ortho-phosphoric acid thereto, the amount of said phosphoric acid added being between 0.2% and 2.0% by weight of the esterification product and then heating the product to a temperature of from 440° F. to 560° F.

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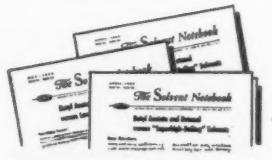

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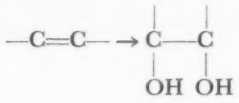
. . . DRYING OILS

(*From Page 10*)

It is possible that two methods of peroxide formation occur:



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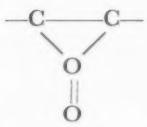
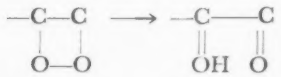


However, these groups are considered rather unstable. Actually what is more likely to occur:

e.g. 

However, the process of polymerization is the cause for the increase of molecular structure, in order that a useful film is derived. Fatty acids upon being polymerized are formed into chain like molecules into dimers and sometimes trimers. The glycerides present combine with neighboring molecules to form a three dimensional large polymer and a dry film results.

It is already known that driers may combine with double bonds in such a manner as to form new compounds, which are more susceptible to oxidation than the original drying oil. If this does happen some of the physical properties might be involved.

Polarity of the drier also plays its part in that gelation and drying will occur more readily by forcing an orientation of the molecules. However, it is well to remember that the greater degree of polymerization, there will be present a smaller amount of resinous, brittle oxidation products. Driers to some extent help mitigate and improve the film but not sufficiently enough to overcome the deficiencies already noted. At best, their main function is to decrease the length of time for the paint film to form into a homogenous and fairly elastic mass, but certainly not enough elastic to cope with the elements for a reasonable length of time.

Use of Styrene and Rubber

IN order, therefore, to improve the properties of drying oils, in recent years, styrene has been copolymerized with drying oils. The best results thus far obtained has been with linseed oil and low hydroxy content dehydrated castor oil, or a mixture of both. Styrene-oil copolymers are soluble in aliphatic hydrocarbons, a factor which makes them non-resistant to gasoline or solvents. However, for outdoor paints they are fast drying, have good color retention, have good toughness, although not too durable, since they are slightly thermoplastic, and are somewhat affected by heat. They reduce very well in viscosity with solvents. However, in comparison with oil based finishes, their properties are found to be superior. They find the best uses for these type of copolymers in air drying decorative finishes and air drying or baked industrial finishes. Their low acid content, very much unlike the conventional drying oils, give excellent pigment suspension and stability to paints formulated with these types of copolymers.

Most recently a waterproof and weatherproof paint which has properties of excellent cohesive and adhesive properties to all material of construction has been developed. This product, a cold setting cement, is formulated from a patented, shrunk rubber and selected high melting oxidized asphaltic hydrocarbons dissolved in an aliphatic solvent. The rubber can also be blended with alkyds, and drying oils. What makes this rubber so useful for incorporation with alkyds or drying oils, is that the films which are formed from it remain flexible at sub-zero temperatures with the adhesion and cohesion being extremely strong. The rubber is immune to the deleterious defects of the oxidizing effects of the elements, and acids of low pH, as well as alkalies of high pH. Its properties of moisture vapor impermeability is truly remarkable, allowing no moisture in the slightest degree to pass though under 1 inch of mercury pressure in 24 hours. Besides these properties, its coefficient of expansion and contraction overlaps that of steel and concrete and wood, due to an additional property of retractability. Materials such as this type of product could be employed with excellent results to overcome the deficiencies already noted. This type of rubber could be blended with drying oils, pigments, and no driers are necessary to give waterproofness. Paints containing chlorinated rubber can be improved tremendously in regard to better adhesion and cohesion of film, at the same time, rendering their films flexible at very low temperatures.

An attempt has been made to make direct comparison between drying oils and driers, as compared with materials where unsaturation is noted by conjugated double bonds not separated by long distances in the chain. Without attempting to summarize it will be found that drying oils by themselves must be supplemented with faster polymerizable materials to get better results of film waterproofness, elasticity and weatherability.

•

New Positions at Hercules

Hercules Powder Company has created two new top posts at its Experiment Station in Wilmington, Delaware. Dr. Peter Van Wyck, formerly technical assistant in the Research Department, becomes assistant director of the Experiment Station responsible for the work done by the Cellulose Products, Explosives, and Virginia Cellulose research divisions. Dr. Richard S. George, formerly manager of the Naval Stores Research Division, will be assistant director of the Experiment Station responsible for the work done by the Naval Stores, Paper Makers Chemical, and Synthetic reseach divisions. Dr. Reginald W. Ivett succeeds Dr. George as the manager of the Naval Stores Research Division.

The company has also announced the transfer of two men from the home office to the Experiment Station research staff. They are: Edmund Winterbottom, who is appointed administrative assistant to Dr. Schultz; and Dr. John T. Hays, appointed special assistant to the Scouting Research Division. Dr. Hays will also continue his university contacts with prospective technical employes.

•

Frick of Standard Ultramarine Dies

Omar G. Frick, president of Standard Ultramarine Company, died recently after a brief illness.

. . . NPVL CONVENTION
(*From Page 16*)

pared. However, he stated that there are two ways in which Russia could defeat us. The first is by battle and the second is by encouraging us to such extensive financing by deficits that our economy would be wrecked. Therefore, we must get the maximum security for the minimum cost.

Industrial Finishes

The Industrial Finishes held its open forum meeting in which the members of the Steering Committee sat on the platform and answered questions which were brought up by the members. The purpose of the Steering Committee as stated by Mr. Hager is as follows:

A. To serve as an ever present and active force for upgrading of the industry that the public may be better served.

B. To acquaint itself with present and foreseeable problems of the Division.

C. To explore and study those problems, and possible solutions there and initiate corrective measures within legal limits.

D. To formulate plans and programs for the continued advancement of the industry to improve and increase its contributions to all.

Report on Pigments

Mr. D. W. Robertson of the National Lead Co. reported to the association on the subject of titanium as an important raw material for the paint industry. He stated that conditions and the nature of the interest in the subject have changed greatly since his last report in that supplies have been generally adequate during 1949.

During the past few years titanium pigments have become an increasingly important raw material for the manufacture of modern protective coatings. Their use is so diverse, both in trade sales and in industrial coatings that the sale of titanium pigments may be considered as an index of the activity of the paint industry. There will continue to be some growth in the use of titanium pigments in the paint industry since this pigment has become almost the sole source of hiding power for practically all types of whites and light tinted coatings, and the trend is in the direction of further increases in hiding power for most of these products.

Mr. N. W. Putman of the Pigment Color Division of the Imperial Paper & Color Corp, revealed that no startling "new" products have appeared in the colored pigment industry. Research efforts continue to be directed toward the improvement of color characteristics of the pigments long in use. It is highly probable that the trend of future research will be directed to further improvement of color properties, with particular attention being paid to the production of pigments showing greater resistance to change upon exposure.

Scientific Association

The work of the Scientific Section was reviewed in detail by A. E. Horn as chairman. He stated that the purpose of the Scientific Section is to contribute to the technical advancement of the industry and to its fund of scientific knowledge, through research and development work in the fields of chemistry, physics and engineering, and in these fields to promote the most favorable public relations. He further pointed out the cooperative work with other organizations who are interested in problems pertaining to paint or allied products. A report of present investigation included such subjects as Fire Paint Studies, Cold Check Tests, Antioxidants, Metal Staining of House Paints, Paint as a Vapor Barrier, Drying Oil Developments, Catalytically Cured Varnishes, and Dispersions.

The last day of N. P. V. & L. A. meeting was marked by election of officers and a closing talk by Mr. Wallace F. Bennett, President of the National Association of Manufacturers.

William C. Dabney of Devoe & Reynolds Co. was unanimously elected vice president of the Association, and Roy B. Anderson of Brooklyn Varnish Mfg. Co. was elected treasurer.

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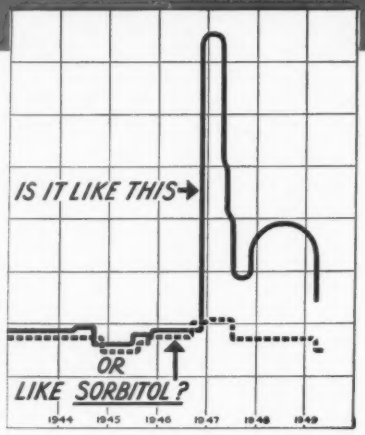

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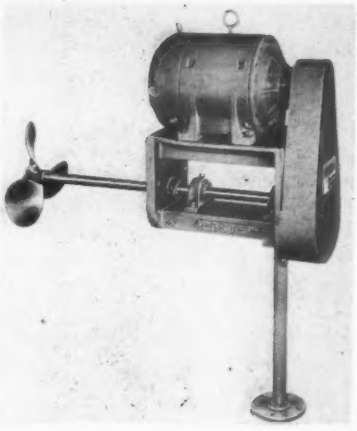

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SIDE ENTERING MIXER

Self-Sealing Shaft

Side entering stainless steel mixer is available for either direct drive or V-belt drive. Self-sealing shaft eliminates the problem of repacking the stuffing box without draining the tank or loss of liquid. H. K. Porter Co. Inc., Pittsburgh 22, Pa. PVP—November.

TRIMETHYLHEXANOL

Solvent for Lacquers

Previously this chemical was available only in sample form. Now commercial quantities are available and are offered to the protective coatings industry as a solvent for the formulation of lacquers, anti-foam agent, and as an intermediate in the preparation of ester type of plasticizers, modified alkyd resins, and surface active agents. Ammonia Dept., E. I. du Pont de Nemours & Co., Wilmington 98, Del. PVP—November.

ACROLEIN DERIVATIVES

For Commercial Use

Acrolein and its derivatives are now being produced in large-scale quantities for the first time. Primary derivatives of acrolein are also in commercial production. Of particular interest to the surface coating industry is the primary derivative allylidene, an interesting monomer for polymerization and copolymerization products. Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. PVP—November.

VERTICAL DRUM LIFTER

For Open and Closed Drums

All steel lifter can handle open and closed drums in vertical position by crane or hoist. Palmer-Shile Co., 16016 Fullerton Ave., Detroit 27, Mich. PVP—November.

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Automatic Drain

Pump equipped with special diaphragm made of heavy cross weave cord, plastic coated on both sides, is recommended for paint thinners and drying oils. Plated parts prevent corrosion and pump is fitted with automatic drain back feature, brass valve seats and Bakelite valve disc. Also, it is equipped with adjustable suction pipe to fit ¾" 1½" or 2" openings. Sells for $17.75. General Scientific Equipment Co., 1104 Packard Building., Philadelphia 2, Pa. PVP—November.

LONG OIL ALKYD

Flat Wall Paints

Alkyd resin as a vehicle for flat wall paints is now being marketed. Wet scrub tests using paints containing this resin have shown good resistance to washability, according to the manufacturer. The solution known as Aroflat 3010, and classified as a pure long oil alkyd, is offered as a single vehicle for use in the production of flat wall paints. In addition to its washability characteristics, it is said to have good brushing properties, good color retention, excellent leveling, good hold-out, good pigment suspension and wetting. U. S. Industrial Chemicals, Inc., 60 E. 42nd Street, New York 17, N. Y. PVP—November.

HEAVY DUTY BARREL TRUCK

Adjustable Chime Hook

One-man barrel truck is designed for moving wood barrels or steel drums weighing up to 1,000 lbs. This truck is the double center column type with rubber handle bar grips. The chime hook is adjustable to permit handling any height of drum or barrel. Buffalo Caster & Wheel Corp., 182 Breckenridge Street, Buffalo 13, N. Y. PVP—November.

Buffalo Caster

NEW PRODUCTS

FLEXOL PLASTICIZER

Flame-resistant

Carbide and Carbon Chemicals Corporation has announced the commercial availability of "Flexol" plasticizer 3 CF (tri-2-chlorethyl phosphate) which is claimed to be flame-resistant and designed primarily for use with cellulose acetate and mixed cellulose esters. "Flexol" 3CF is also used as a plasticizer for nitrocellulose, ethyl cellulose, methacrylate resins, and synthetic rubber.

When "Flexol" 3CF is used as the sole plasticizer in cellulose acetate films, concentrations as low as 10 per cent are reported to produce self-extinguishing compositions. This plasticizer pours freely below – 25°C. and is less volatile than dibutyl phthalate. The solubility of 3CF in mineral oil at 20°C. is less than 0.7 per cent by weight, but 3CF is miscible with the common lacquer solvents. Carbide and Carbon Chemicals Corp. 30 E. 42nd St., New York, N. Y. PVP—November.

MALEIC ANHYDRIDE

Briquette Form

Maleic anhydride is being supplied to the surface coating industry in briquette form for the purpose of obtaining maximum ease and safety in handling as well as processing efficiency. It is said that the uniformity of the briquettes and the absence of dust and fines, which are screened out, make them particularly attractive to plant men. Moisture pick-up and subsequent hydrolysis is held to a minimum because of the small exposed surface per unit weight. There is no increase in price over regular types. Monsanto Chemical Co., St. Louis 4, Mo. PVP—November.

TERTIARY AMINE

Emulsion Paints

Diethylaminoethanol is a new chemical intermediate developed for emulsion work. This tertiary amine forms an azeotropic with water and, according to the manufacturer, improves water-spot resistance of wax films. It is suggested as an intermediate in making oil-in-water emulsions, for example, self-polishing floor waxes, and emulsion paints. Samples are available. Sharples Chemicals, Inc., 123 South Broad St., Philadelphia 9, Pa. PVP—November.

WRINKLE FINISH VEHICLES

Require No Further Cooking

Manufacturers of industrial finishes will be able to produce uniform, Wrinkles without further cooking. Only the addition of driers and pigments are necessary. Three types of vehicles are available:

WV-101 S is a short oil oleoresinous varnish producing Wrinkle of uniform design and texture.

WV-210 L is similar to WV-101 S except with increased oil length to improve flexibility. It will give harder films in shorter baking cycles.

WV-301 A is an alkyd type recommended for formulation where alkyd resins are specified and for shorter baking cycles.

Orders are being accepted for shipment by January 1st. The New Wrinkle, Inc., 1819 Bankers Bldg., Chicago 3, Ill. PVP—November.

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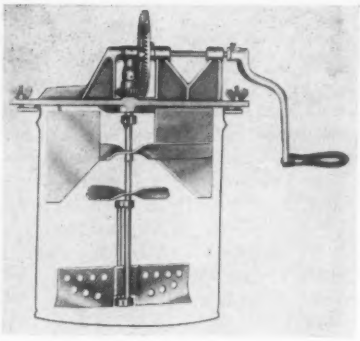


Standard Churn

HAND OPERATED MIXER
For Tinting

This mixer is designed to mix small batches of paint quickly and conveniently. It is available in both 5-gallon and 1-gallon sizes and fits tightly on any can with no special attachments required. It is said that this mixer is particularly adapted for mixing tints evenly with all streaking eliminated. Suggested uses include mixing enamels, lacquers, aluminum bronze powders or paste, and all casein or cold water paints. The Standard Churn Co., Wapakoneta, Ohio. PVP—November

SYNTHETIC WAX
Flattening Agent

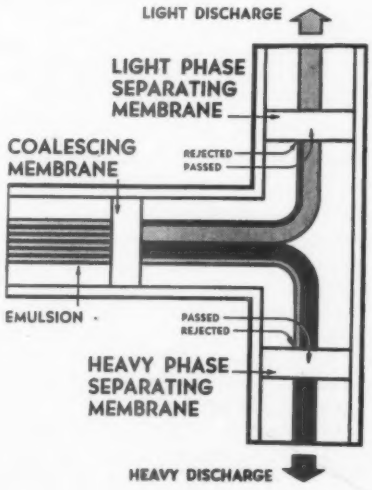
A new synthetic wax, Ceramid, is now available in commercial quantities. Chemically it is an alkyl stearamide. It is hard, light yellow in color and melts between 79.5°–80.5° C. It is insoluble in water and is more soluble in organic solvents than natural and other commercial synthetic waxes. Ceramid is compatible, in varying proportions with asphalt, carnauba wax, cumarone resins, ethyl cellulose, microcrystalline wax, parrafin wax and Acrawax C.

Its use is indicated for protective coatings and films to be deposited on various surfaces out of solvent solution. It emulsifies to give a white matt finish which can be rubbed to a high polish. It may be used as an anti-tack agent for resin organisols. In most lacquers and enamels it dissolves clearly and serves as a flatting or gloss reducing agent. In polishes, insulating compounds, etc., it is used in blends with other waxes and hydrocarbons for special effects.

Samples and further data may be obtained from the Glyco Products Co., Inc., 26 Court St., Brooklyn, N. Y. and Natrium, W. Va. PVP—November.

ILLUMINATED MAGNIFIER
Adjustable Type

Illuminated magnifier, with knurled pinion for adjusting the 20 or 40 power tube to the user's visual needs is recommended for laboratory use in examining metals, finishes, and raw materials. Available with 20 or 40 power lenses, in either the electric plug-in model (120 volt, AC or DC) or in battery model. E. W. Pike & Co., Elizabeth, N. J. PVP—November.



Selas

LIQUID SEPARATOR
For Emulsions

The Selas liquid separator employs the physical principle of successive membranes, in which the first of the series has the function of coalescence and the second has the function of final separation. The controlled performance membranes permit rapid flow rates through the unit, from 500 to 1,500 gallons per hour, with relatively low pressure-drops, according to the manufacturer.

Emulsions usually encountered in chemical processes, such as steam distillations, solvent extractions, and organic reactions, can be separated by these units. Emulsions that are chemically stabilized by surface-active agents cannot be separated. Solid contaminations, particularly of gelatinous nature, may cause abnormal pressure drops across the coalescing membranes. Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa. PVP—November.

ELECTRIC LIFT TRUCKS
Gas-Electric Powered

The Barrett Power Ox line of electric lift trucks, pallet trucks and tractors, all of which have been powered by storage batteries, are now optionally available with Ready-Power units.

This gas-electric power unit has been developed to obtain efficiency from motorized lift trucks and to provide a power supply that delivers maximum voltage 24 hours a day when needed. A number of advantages are submitted by the unit's manufacturer.

Full information may be obtained from Barrett-Cravens Co., 4601 S. Western Blvd., Chicago 9, Ill. PVP—November.

DRUM STORAGE RACKS
Ease in Handling

Steel storage rack system provides easy handling of drums without its removal from the rack, or disturbing other drums. The design of the racks makes any drum accessible when it is wanted.

The illustrations show how drums are stored and removed by this system at the vast Sinclair Research Laboratories, Harvey, Ill. These racks come in 20-drum sections, thus storage facilities can be increased, rearranged or moved. Barrett-Cravens Co. 4609 S. Western Blvd., Chicago 9, Ill. PVP—November.

Barrett-Cravens

Earl F. Riter

Glidden Names Riter

Earl F. Riter, materials handling expert, was named as administrative assistant to Ralph G. Golseth, who is in charge of the Glidden Company's Soya Products Division in Chicago. A veteran of 14 years service with Glidden, Mr. Riter served as staff assistant in the engineering department of the Soya Products Div., and held the post of assistant general superintendent of the Company's Paint and Varnish Division.

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Atlas Names Enamel Chemist

John A. Stierstorfer has been appointed senior synthetic enamel chemist at the Stamford (Conn.) branch of the Atlas Powder Company's Industrial Finishes Department. Mr. Stierstorfer brings to Atlas a background of a dozen years in the development laboratories of eastern and midwestern finish and paint manufacturers. He completed his studies at Pratt Institute, Brooklyn, N. Y. and began his career with a paint manufacturer in that city.

•

Socony Moves Offices

Executive and eastern sales office of the Socony Paint Products Div. of the Socony-Vacuum Oil Company have moved from 111 Broadway, New York to the divisions new plant at Metuchen, N. J. Early in 1950, it is expected that all manufacturing operations will be transferred from the present plant in Long Island City to Metuchen.

Minnesota Mining Promotions

Five promotions in top-level management of the Minnesota Mining & Manufacturing Co. have been announced.

William L. McKnight, president of the firm since 1929, has been elected to the newly created post of chairman of the board. His successor to the presidency is Richard P. Carlton, former executive vice president in charge of research, engineering and manufacturing. Archibald G. Bush, former executive vice president and director of marketing and distribution, becomes chairman of the executive committee. Two new executive vice presidents have also been named. They are George H. Halpin and Herbert P. Buetow. Halpin, former vice president for sales, will continue to direct sales activities. Buetow, 3M's treasurer since 1939, becomes executive vice president in charge of finance.

•

Blake Joins United Lacquer

Dudley B. Blake has been appointed General Sales Manager of United Lacquer Mfg. Corp., Linden, N. J., and Everett, Mass., manufacturers of industrial finishes, synthetics and paints.

•

Binney & Smith Officers In Europe

Norman Lee Smith, vice president of Binney & Smith Co. is on a two month's stay in Europe, where he will visit the firm's offices in London and Paris and representatives in Holland, Italy and Germany. Edwin B. Brooks, manager of Binney & Smith International is also in Europe covering all principal areas in which his division operates. He will call on customers in the rubber, paint and ink industries. L. J. Venuto, research director is spending the next several weeks in Europe making a detailed survey of ink and paint industries abroad.

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ACS Paint Officers

Officers elected at the recent Division of Paint, Varnish and Plastics Chemistry of the American Chemical Society are as follows:

Charles R. Bragdon, manager of the special services department of the Interchemical Corp., New York was chosen chairman. He succeeds Dr. Malcolm M. Renfrew, director of chemical research for General Mills, Inc., who was named to the division's executive committee.

Dr. E. E. McSweeney of Battelle Memorial Institute, Columbus, Ohio was named chairman-elect, and Henry F. Payne, American Cyanamid Co., secretary-treasurer. Dr. A. C. Zettlemoyer of Lehigh University, and N. A. Skow of the Snythane Corp. were elected to the divisions executive committee.

Troy Acquires Mill Line

John L. Parsons, President of Troy Engine & Machine Co., Troy, Pa., manufacturers of power equipment announced recently the formation of a Process Machinery Division with the acquisition of two well-known and long-established lines as a nucleus. The company has acquired all the finished machines, inventory, rights, patents, etc. of the Colloid Mill Division of C. O. Bartlett & Snow Co., Cleveland, Ohio and similar property of the roller Mill and Mixer Division of the Brasington Corporation, Cincinnati, Ohio.

Roy S. Stuckless, General Sales Manager of the Troy Company, will have charge of sales of the two acquired lines. Lawrence A. Clark, production manager of the company, will continue in that capacity in connection with the mills and mixers.

M. P. Hofmann, formerly of the Colloid Division, Bartlett & Snow, has Joined the Troy Company as chemical engineer on sales and product development. Malcolm B. Nicholls, formerly with Brasington, has joined Troy in a sales and advisory engineering capacity. All of the newly acquired equipment and subsequently developed equipment will be marketed under the trade name "Troy."

•

Plant Maintenance Show

Many subjects of vital interest to the paint industry will be on the program for discussion at the first Plant Maintenance Show, which will be held in the Auditorium, Cleveland, O., Jan. 16–19.

The four-day exposition, which will be held concurrently with a four-day conference, is the first ever devoted exclusively to maintenance. The program will be sponsored jointly by the American Society of Mechanical Engineers and the Society for the Advancement of Management. The Cleveland Engineering Society will be hosts at a dinner for visitors. L. C. Morrow, editor, Factory Management and Maintenance, will be general chairman of the conference.

Topics scheduled for discussion include: "Maintenance Organization and Management;" "Budgeting the Maintenance Operation;" "Selection and Upkeep of Lighting Equipment;" "Upkeep of Motors, Controls and Distribution Equipment;" "Using Electrical Instruments in Maintenance;" "Upkeep of Floors, Walls and Roofs;" "Protection, Decoration and Cleaning of Surfaces;" "Sanitation and Housekeeping;" "Lubrication;" "Application of Service Equipment;" "Protecting the Plant," and "Protecting the Worker."

More than 100 exhibitors will give demonstration of machinery, materials and methods for reduction of costs in plant maintenance.

National Lead Changes

Dr. Joseph A. Orsino, George Vahrenkamp, Dr. Charles H. Moore and Edwin P. Peterson have been transferred to the New York offices of National Lead Company to act as assistants to Alex Stewart, director of research. They will integrate and coordinate research and development for all the company's laboratories.

Dr. Moore began his company employment in 1945. He obtained his doctor's degree from Cornell University and was a professor at Pennsylvania State College before joining National Lead. He also worked for the Carborundum Company. Dr. Moore has been a department supervisor at the Titanium Division laboratories in Sayreville, New Jersey.

Dr. Orsino joined the company in 1939. He received his doctorate from Ohio State University and was with a storage battery company before coming to National Lead.

Mr. Peterson is a graduate of the University of Colorado. He joined National Lead in 1937 and has been in charge of paint and pigment research and development at the laboratories in Brooklyn.

Mr. Vahrenkamp was graduated as a physicist from Washington University. He worked with the Bureau of Mines and another pigment company before his employment with the company in 1944. Mr. Vahrenkamp has been engaged in metallurgical and smelting research at the Brooklyn laboratories.

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G-E Appoints Control Engineer

Dr. F. E. Satterthwaite has been appointed quality control engineer of the Plastics Division in the Chemical Department of the General Electric Company according to an announcement by Mr. F. W. Warner, engineering manager of the division. Dr. Satterthwaite has been quality control engineer for the product service division of the Company in Bridgeport, Connecticut.

For several years Dr. Satterthwaite was in actuarial and statistical work for insurance companies in New York and Hartford. He is a member of the American Statistical Association and other mathematics societies. In 1946 Dr. Satterthwaite came to General Electric as quality control engineer in the fractional horsepower motor engineering division at Fort Wayne, Indiana. In 1948 he went to Bridgeport, Conn., to do the same work in the product service division.

New Finishes Company

Rexton Finishes, Incorporated has been formed to produce specialized technical coatings with its manufacturing facilities in Irvington, New Jersey. Heading the company will be Albert A. Miesem, who will have associated with him S. A. Metrick, W. H. Stephens, R. V. Kirk, R. K. Hungerford, Paul Andersen, G. F. Caskey, W. G. Mengel, and P. J. Thouluc. All of them have had extensive experience in the products finishes business. Rexton's product line will embrace a wide range of synthetic and lacquer coatings specifically designed to meet the particular needs of their customers.

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G-E Promotes Slayton

Clarence H. Slayton, manager of Facilities Engineering in the Chemical Department of General Electric Co. has been promoted to manager of Methods and Equipment Laboratory in Pittsfield. Mr. Slayton came to G-E in 1944 as an engineer in the Methods Equipment Laboratory. In 1944–1945 he was safety engineer in the Chemical Works of the Plastics Division, 1945 to February 1947 he was mechanical engineer of the Chemical Works and later was engineering manager of the Compound Division.

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I. Milton Colbeth

Baker Elects Colbeth

At a recent meeting of the stockholders I. Milton Colbeth was elected president of the Baker Castor Oil Company. During the last thirty years Mr. Colbeth has served the company well, demonstrating a capacity for leadership in several key positions. He joined Baker early in 1920.

After setting up a control system for Baker, Mr. Colbeth's time was devoted chiefly to original research in castor oil processing, its derivatives and applications. In 1929 Mr. Colbeth was appointed chief chemist in charge of organic research and process design; in 1931 he became chemical director with supervision over all research, plant expansion, sales service and other technical activities of the company; in 1948 he was elected vice president of the operating division in complete charge of all technical and manufacturing operations.

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Numerical Color Rating

Colors can now be given a numerical rating through the use of a special mechanical and electronic device. Colors are given a numerical rating which will remove guesswork in color matching. Dr. I. H. Godlove of the General Aniline and Film Corp. addressing the American Association of Textile Chemist and Colorists said that the numbers for various colors are recorded by means of a spectrophotometer coupled with the tristimulus integrator with precise evaluation at sufficient speed.

Du Pont Promotes Graves

E. S. Nickerson, general manager of the Fabrics and Finishes Department of the Du Pont Company, recently announced the appointment of Dr. George D. Graves as director of the departments chemical division. He succeeds John Marshall, who died on August 27.

Dr. Graves has been with the Du Pont Company for more than 22 years, and since 1945 has been assistant director of the chemical division of the Plastics Department. Dr. Graves will have two assistant directors, Dr. J. Dorman McBurney and James B. Bullitt, Jr., at present director of the Philadelphia laboratory.

Mr. Nickerson said that the increase in the administrative staff of the chemical division of the Fabrics and Finishes Department was effective to continue to meet the needs of the existing business in the finishes field, coated fabrics and related products, and at the same time to provide for future growth and diversification.

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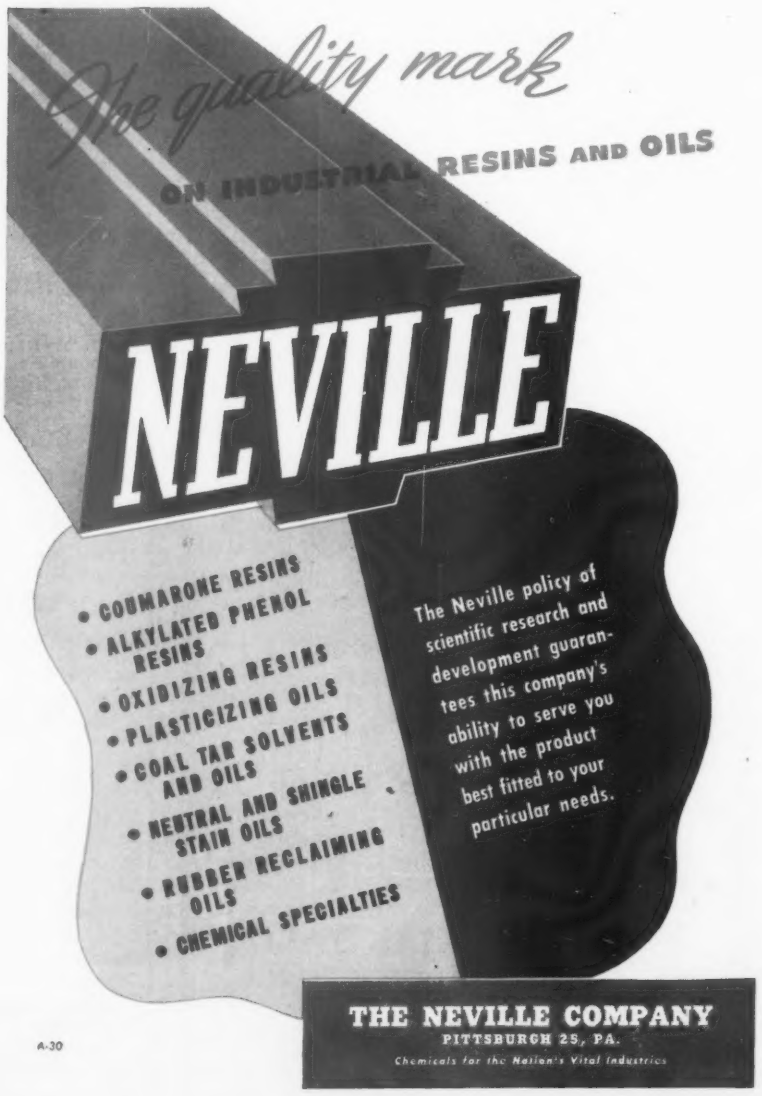
G-E Names Market Analyst

Robert J. Baumann has recently been appointed an analyst in the marketing research section of the Chemical Department of General Electric Co. in Pittsfield, Mass.

Prior to his connection with G-E, Mr. Baumann held a position in marketing research with the Indoil Company in Chicago. He also served as assistant editor of the "Chemical Bulletin", a publication of the Chicago Section of the American Chemical Society.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TECHNICAL Bulletins

CHEMICAL STATISTICS

The Chemical Statistics Directory for 1946–1947 has been published by the Dept. of Commerce. This directory consists of references to more than 30 types of statistics found in 200 Government publications, and covers 2500 individual chemicals. Write to the Superintendent of Documents, Washington 25, D. C. and request Directory No. 2. Price 20 cents a copy.

RESIN AND OIL SOLUTIONS

Crown Oil Products Corp. has recently published a new manual describing solid resins, alkyd resin solutions and oils manufactured by their firm. Specifications, suggested uses and drier recommendations for each product are covered. Copies of the manual may be obtained by writing on a business letterhead to: Crown Oil Products Corp. 2–20 49th Ave., Long Island City 1, N. Y.

VINYL FORMULATIONS

Monsanto technical bulletin O-D-113 gives twenty-two plasticized polyvinyl chloride formulations which are basic types for compounding transparent films, coated fabrics, floor tile, sink tops, extruded items etc. Recommended plasticizers and stabilizers with the name of manufacturer are listed. Organic Chemicals Div. Monsanto Chemical Co. St. Louis 4, Mo.

LONG-CHAIN DIOLS

Eight-page bulletin discusses the new high molecular weight diols with suggested uses as blending agents, plasticizers, moisteners, intermediates and solvents. Physical properties such as specific gravity, viscosity, refractive index, freezing and boiling points are included to-gether with a chart comparing the hygroscopities of diols. Specialized applications are also discussed. Write to Carbide and Carbon Chemical Corp., 30 E. 42nd Street, New York 17, N. Y. and request bulletin F-6719.

MIXING MACHINES

The H. W. North Co. of Erie, Pa. has published Engineering Data Sheet No. 300–275 and bulletin No. HB-1 describing some of the improved types of mixing and blending machines developed by this company.

SAFETY TIPS

As the end of summer approaches, ventilating arrangements and other safegurads intended to protect workers in solvent-using departments should be re-examined.

During the summer months, it may be that natural ventilation from windows and doors has taken care of some of the load of removing solvent vapors. With the drop in temperature, this source of ventilation will be cut off and other means of vapor removal, such as mechanical ventilation, will increase in importance. It is therefore desirable to check ventilating systems before the winter season to make certain that they are adequate, functioning properly and in good repair.

During warm weather, occasional jobs with solvents may be done outdoors. When such work is moved indoors, respirators are often depended upon to prevent vapor inhalation. Respirators, too, should be checked to make certain that they are in good condition and ready for use. Where canister-type respirators are provided, it is important to check the service record of the canisters to assure that their contents have not outlived their usefulness.

Winter months may bring an increase in dermatitis, because of the increase in dry, chapped skin. A good lubricating cream, provided near the washstand, will be helpful in preventing skin difficulties from solvents.—Safety Research Institute.

ALKYD FORMULATIONS

Bulletin S-46 describes the use of Cellolyn 502, an alkyd resin based on pentaerythritol, in quality baking whites and for sunlight-resistant clear lacquers. Obtain your copy by writing to the Synthetics Dept., Hercules Powder Co., Wilmington, Del.

PIGMENT DATA SHEETS

The C. K. Williams & Co. of Easton, Pa., has published a complete catalog listing of their standard pigments to-gether with technical data sheets describing their chemical and physical properties and uses.

REVISED WARNING MANUAL

A revised edition of the manual on "Warning Labels", which was first published in 1945, has been issued by the Manufacturing Chemists Association. The manual is intended as a guide for the preparation of warning labels for hazardous chemicals, and also to facilitate an effective uniform pattern of chemical labeling throughout the nation and to protect the consumer in the handling and use of the chemicals. Labeling laws in several states and territories are also covered. Copies may be obtained by writing to Manufacturing Chemists Association, Woodward Building, Washington, D. C.

PLASTICIZER CATALOG

Plasticizer catalog published by Tennessee Eastman Corporation of Kingsport, Tennessee gives complete information on all plasticizers manufactured by that company. Of particular interest to protective-coating industry is a new low-color dioctyl phthalate (DOP), specifications and properties of which are included in the catalog. This plasticizer, having a maximum APHA color rating of 50, according to the manufacturer, is now being produced in commercial quantities in both a plastic and an electrical grade.

Two glyceryl esters and other phthalate plasticizers are also included in the new catalog, copies of which are obtainable from the corporation in Kingsport, Tennessee.

REPORT ON GERMAN RESINS

Data on the advances in Germany's wartime and post war activities in the plastic and lacquer industries is reported in Research Bulletin No. 37, recently issued by the Research Information Service, 509 Fifth Avenue, New York, N. Y. The bulletin describes patent application, gives progress reports and manufacturing processes by various German concerns.

ORGANIC CHEMICALS

The 1950 edition of the booklet, "Physical Properties of Synthetic Organic Chemicals," has been issued by Carbide and Carbon Chemicals Corporation. This 16-page booklet has been designed as a condensed guide for users of organic chemicals. It contains data on applications and physical properties for more than 200 synthetic organic chemicals. The material is presented in tabular form for ready and easy reference. Copies may be obtained without charge by writing to Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York 17, N. Y. Ask for Form 6136.

PAINT FORMULATIONS

Several of the latest type corrosion inhibitive paint formulations for the protection of iron and steel exposed to marine conditions are included in Red Lead Technical Letter No. 4, published by the Lead Industries Association. Complete detailed formulations of high performance synthetic vehicle paints are presented for marine atmospheres, intermittent salt water immersion and continuous salt water submersion. Copies of this twelve page booklet can be obtained without charge by writing to the Lead Industries Association, 420 Lexington Ave., New York 17, New York.

AROMATIC SOLVENTS

This booklet deals primarily with aromatic distillates as solvents and their use in varnishes, industrial paints and lacquers. It discusses the solvating power of these distillates with common coating resins and synthetic rubber. Solvents covered are benzol, toluol, xylol, hi-flash solvent, crude light solvent, and wire enamel solvent. Physical and chemical characteristics are tabulated. Handling and shipping of these solvents are covered. Safe use in regard to toxicity and flammability are taken up in detail, and a section on testing methods is also included. This booklet may be obtained by writing on company letterhead to the Barrett Div., Allied Chemical and Dye Corp., 40 Rector St., New York 6. N. Y.

TRAFFIC PAINT TESTING

Due to the scarcity of literature on the subject of traffic paint testing, the U. S. Industrial Chemicals, Inc., 60 E. 42nd St., New York, N. Y., has reprinted and neatly bound Fred S. Byerly's article on Laboratory Testing of Resistance of Traffic Paint to Bleeding, which appeared in the A.S.T.M. Bulletin of Sept. 1949. It was written at the request of A.S.T.M. who felt that the data compiled during the development of the Tentative Method of Laboratory Test for Degree of Resistance of Traffic Paint to Bleeding, would be of value to the paint industry.

AGITATOR CATALOG

Eclipse Air Brush Company, Pneumix Division, 238 Park Avenue, Newark 7, New Jersey are distributing a new 28 page catalog "Pneumix in Action."

The catalog lists Pneumix applications. In addition, 17 pages show illustrations of actual installations in a wide variety of industries. Details of the type of Pneumix used and for the reasons for use accompany each picture.

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STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, March 3, 1933 and July 2, 1946, of PAINT and VARNISH PRODUCTION, published monthly at Lancaster, Pa., for October 1, 1949.

State of New York, County of New York.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared John Powell, who, having been duly sworn according to law, deposes and says that he is the publisher of PAINT and VARNISH PRODUCTION, and that the following is, to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper, the circulation), etc. of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933 and July 2, 1946, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, and editor are: Publisher, Powell Magazines, Inc., 855 Avenue of the Americas, N. Y. City; editor, Anthony Errico, 855 Avenue of the Americas, N. Y. City.

2. That the owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Powell Magazines, Inc., John Powell, Ira P. MacNair, Alice L. Lynch, all of 855 Avenue of the Americas New York City.

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(Signed) John Powell
Publisher

Sworn to and subscribed before me this 29th day of September, 1949.

Daniel D. Randell, Notary Public
Commission Expires March 30, 1950

. . . 27th CONVENTION
(*From Page 15*)

Dr. Long's Address

On the final day, a description of British and French paint factories, including equipment and manufacturing methods not in use in the United States, was given by Dr. J. S. Long, director of research for the Devoe & Raynolds Co., Inc. Having toured Europe this summer, he gave an official report of his visits and talks before the International Fair at Basle, Switzerland, and the Conference of the Oil and Colour Chemists' Association in Rothesay, Scotland.

Dr. Long also reported on his visits to six plants in France and England, including the new Astral Celluco plant in Montetaire, France, which he described as "perhaps the most modern paint plant in the world."

The Paint Industries' Show Committee under the chairmanship of G. H. Westcott, staged the biggest and best Paint Industries Show that the Federation has sponsored. This was the fourteenth show, and some 64 exhibitors displayed various raw materials and equipment used in the manufacture, testing and merchandizing of paint products. Technical representatives were on hand to discuss the use of their products in paint manufacturing.

A. T. Montayne is the new president of the Fedaration. He is presently production superintendent of Pratt and Lambert, Inc. in Buffalo. R. D. Bonney of Congoleum-Nairn, Inc. of Kearney, N. J. was elected president-elect and Hiram P. Ball of the Ball Chemical Co., Pittsburgh, was re-elected treasurer. V. C. Bidlack remains as executive-secretary.

Papers Presented

As in the past meetings, several papers on the technical phases of paint production were presented. These were the result of special investigations carried on be the various clubs during the year. Papers delivered were:

The Standardization of Methods of Measuring Viscosities of Nitrocellulose Lacquers—New England Club.

It was the intent of this study to determine the most practicable instrument now available for measuring the viscosity of nitrocellulose lacquers. All the instruments were evaluated as to practicability, accuracy and consistency of results, and ease of operation. The features desirable in viscosity measuring instruments were also cited.

The Development of Insulating Varnishes Used in the Construction of Electrical Equipment—Dr. D. Pagani, The Italian Association, Continental European Federation.

The qualitative evolution of insulating varnishes used for impregnating coils, for varnishing magnetic sheets, and for enameling of wires were discussed.

The Modified Feely-Sandford Penetrometer and its Application—Toronto Club.

A survey on the settling of paint and the use of the Feely-Sandford Penetrometer in the development of a method for the rapid determination of settling properties, was presented.

Dielectric Strength of Pigmented Lacquer Films—New York Club.

Need for accurate knowledge on electrical qualities of pigmented coatings is growing steadily more important with the tremendous strides in the electric and electronic industries. It has been found that there are pigments and toners which raise the dielectric strength of the lacquer vehicle at both lower and higher relative humidity.

Testing of Some Mechanical Properties of Varnish Coatings—Dr. H. W. Talen and Dr. N. A. Brunt, The Netherlands Association, Continental European Federation.

The properties which have been tested are, mainly, resistance against wear, adhesion, elasticity and scratch and impact hardness. Various apparatus used for these purposes are described. A new testing device for the measurement of so-called "soft" abrasion and other newly designed instruments for measuring such qualities as scratch resistance, were also described.

Preliminary Investigation of Pigment Dispersion by Means of the Ultrasonorator—Pittsburgh Club.

Frequently, statements have been published that pigment dispersions could be made advantageously by means of ultrasonic waves. Investigations of the use of the "Ultra-sonorator" shows that certain pigment dispersion of North Standard Fineness 8 can be secured with this apparatus, provided the mass, pigment concentration, viscosity, amplitude of vibration, and time of treatment are held within certain limits.

A Study of Primers for Ferrous Metals in an Atmospheric Exposure—New England Club.

Exposures have been of sufficient duration to indicate trends, and data was presented covering weathering results of key primers.

Pigment Volume Concentrations in White House Paints in Oil-Conserving and Pre-War Vehicles—Montreal Club.

Panels exposed at 45 degrees were sufficiently weathered to justify conclusions, and it was found that P.V.C. is not so critical in the oil-conserving vehicle as in full oil vehicles. Satisfactory P.V.C. lies between 31% and 37% and an average of 34% is optimum in both cases.

Color Photography as a Technical Aid in the Scientific Study of Paint Products —Golden Gate Club.

A method for recording scientific developments for the paint industry is described, and examples of results obtained by the use of color photography were presented by color slides which serve as a record of weatherometer, fadeometer and outside weathering tests.

Study of Methods for Determining Abrasion Resistance of Clear Floor Coatings—New York Club.

This paper presented the results of some of the generally accepted laboratory methods for determining abrasion resistance of clear floor coatings. These coatings were evaluated under field conditions after which they were tested by accepted laboratory tests for abrasion resistance.

Spectrophotometry of Pigments—Los Angeles Club.

This paper presents a quantitative relation between pigment concentrations and reflectance through the use of the Kubelka-Monk equation. With this new tool, it is possible to match colors or make any predetermined color.

Reactivity of Some Special Oils with Basic Pigments—Northwestern Club.

Three soybean oils representing various types of "drying soybean oil" commercially available were obtained for this work. Several series of vehicles were prepared, and paints with high zinc oxide content were made and viscosities determined for a period time to evaluate reactivity.

Tall Oil Varnishes: Exposure Results—Northwestern Club.

A short report on the completed exposures of Tall Oil varnishes which were made last year.

Dispersion Studies of Titanium Dioxide Pigments—W. von Fischer, W. D. Trautman and J. Friedman, Case Institute of Technology.

Electron micrographs have been made of dispersions of titanium dioxide pigments in pure liquids, in heptane containing surface active agents, and in an enamel vehicle. The enamel vehicle dispersion of pigments has been compared with Baker-Perkins, Roller Mill and Pebble Mill grinds.

CLUB NEWS

PITTSBURGH

Forty-eight members and guests attended the regular monthly meeting on Nov. 7th.

F. B. Stieg of the technical service laboratories of the Titanium Pigment Corp. was guest speaker. His subject was "Emulsion Paints". He spoke on developments in gloss emulsion paints. Such studies as pigmentation, vehicle composition, oil phase, protective colloids, and emulsifying agents were covered in detail. One general formula was suggested and comparisons were made with gloss enamel paints evaluating such properties as color, gloss, hiding power, drying and flexibility. Presentation was accompanied with slides.

PHILADELPHIA

The October meeting was held at the Engineers' Club on Oct. 19th with 130 members and friends present, a record attendance.

R. W. Matlack of the Technical Committee reported that there are three active groups on the committee and that an effort will be made to introduce work on production problems at the next committee meeting. A special invitation is being made to production men. He also reported that the contract with Lehigh University has been negotiated regarding a project on mixing and mixing equipment, and the work is proceeding in this respect. Dr. A. C. Elm of New Jersey Zinc is chairman of the committee overseeing this project.

James Heckel reported that the course on paint technology is proceeding well with 90 members attending. The support is excellent, and constructive criticism is welcomed in order to improve the course.

S. B. Stieg of Titanium Pigment Corp. presented a paper on "Flat Emulsion Paints".

NORTHWESTERN

President Wood opened the meeting on Oct. 7th by asking each member and guest to rise and announce his name and company affiliation.

A. L. Bayles, manager of the Fine Particle Process Dept. of the C. H. Wheeler Mfg. Co. of Philadelphia, was presented to the club. He discussed the subject "Fine Particles" from the standpoint of change in physical behavior as particle size is reduced. He showed how decreased particle size eases the problem of dispersion. Mr. Bayles showed slides depicting the type of equipment used in fluid grinding and also showed working installations of this equipment. He stated that it is not beyond the possibility to set up a continuous grinding-dispersion system so that pigments could be dispersed in paint or enamel vehicles without the necessity of using conventional mixing or grinding equipment.

NEW YORK

Dinner meeting was held at the Building Trades Employers' Association on November 10th.

The program included two reports by the technical committee. Sub-Committee #60 presented a report on New Problems by Edwin P. Peterson. Sub-Committee #61 on Flooding and Floating by Anthony Skett. Henry F. Payne of the American Cyanamid Co. presented a paper on "Emulsion Paints, Their Theory and Practice". It was a survey of the literature intended to cover the general theory of emulsion paints, and to provide the paint formulator with information on the types of materials used in emulsion paints, and the reasons for the use of each material.

LOUISVILLE

The October meeting was held on Wednesday the 19th at the Seelbach hotel with 54 members and guests attending.

Dr. C. B. F. Young and Karl Perkins of the National Southern Products Company addressed the membership on Tall Oil. Its origin, composition and properties were explained. Methods of handling in the kettle were outlined together with type formulations. Equipment and plant facilities were illustrated with lantern slides.

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LOS ANGELES

The regular meeting was held on October 5, 1949 attracting some 120 members and guests.

The principal speaker was Roswell J. Blackinton, Chairman of the Technical Committee, who spoke on "Color Matching by Photo Photometry", describing scientific developments and results obtained by the use of color photography in the paint industry.

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